

U.S. Vatican Envoy Won't Participate In Waldheim Events

ROME — The United States said Monday that the head of its diplomatic mission to the Vatican would not attend any ceremonies connected with the visit there Thursday of President Kurt Waldheim of Austria.

Kiosk 3 Are Sentenced In San Juan Fire

SAN JUAN, Puerto Rico (AP) — Three former hotel employees who pleaded guilty to arson in the New Year's Eve fire that killed 97 at the Dupont Plaza Hotel were sentenced Monday to prison terms ranging from 75 to 99 years, substantially longer than prosecutors had asked.



Scott Simpson after sinking a birdie putt as he put together a victory in the U.S. Open golf tournament. Page 21.

GENERAL NEWS U.S. Democratic candidates are reaching a consensus on the party's 1988 agenda. Page 3.

Technology Quarterly The limits of human endurance in space, innovations on the assembly line, the latest in home electronics — in the first Technology Quarterly, Pages 9-14.

Dow close: UP 24.66 The dollar in New York: DM 2 Yen FF 1.847 1.5875 146.20 6.1565



U.S. Asserts That Dispute on Pershings in West Germany Delays Arms Pact

Max M. Kampelman, left, the chief U.S. arms control negotiator, said Monday that the dispute over the 72 Pershing-1A missiles in West Germany whose warheads are under U.S. control was delaying an agreement on controlling medium and shorter-range missiles.

Islam at Center of Ferment in Tunisia

By Alan Cowell New York Times Service TUNIS — Faced with a surge of fundamentalist dissent, Tunisian officials have been charging that "Khomeini-ist" insurgents, backed by Iran, are plotting a violent overthrow of the government here in pursuit of Tehran's threats to export Islamic revolution.

and Western diplomats to have been tortured to extract confessions. In the second week in June, the police used tear gas and riot sticks to disperse several hundred fundamentalists demonstrating in central Tunis against the detention of their comrades in the worst crackdown since 1981.

The country's state-sponsored newspapers — all others are suspended or closed — carried reports Sunday of new arrests of what were called "Khomeini-ists" after the Ayatollah Ruhollah Khomeini, Iran's revolutionary leader. The reports did not say how many people had been detained in two roundups of purported subversives or when they were arrested.

The newspapers also carried photographs of three shotguns with cartridges, dynamite stolen from a quarry, American Winchester ammunition-loading kits with gunpowder, gasoline bombs and other crude devices such as a bicycle chain, spikes to puncture automobile tires and what was described as a homemade bomb.

Lebanese Said to Reject Being Freed

By Ihsan A. Hijazi New York Times Service BEIRUT — Ali Ossairan, a Lebanese businessman, has rejected his captors' offer of freedom unless his kidnapped companion, an American journalist, is also freed, sources in the Muslim Shiite community said Monday.

Chun Acts To Defuse Protests

Korean Leader Willing to Meet With Opposition

By Clyde Haberman New York Times Service SEOUL — President Chun Doo Hwan was reported Monday to have made important concessions to the opposition — including an agreement to meet with the leader of the main opposition party — but critical details remained vague, leaving the political crisis in South Korea still unsettled.

Rehnquist Court: Justice Brennan's 'Finest Hour'

By Al Kamen Washington Post Service WASHINGTON — The first year of the Rehnquist Supreme Court is turning out to be, in the words of one chastened conservative, "Bill Brennan's finest hour."

William H. Rehnquist to chief justice and the addition of Antonin Scalia, has managed to win significant victories only in the area of its traditional strength, criminal law. The court upheld the constitutionality of preventive detention before trial and rejected a challenge that the death penalty was racially discriminatory.

Chief Justice Warren E. Burger, when a moderate-liberal coalition dominated. "The major, big cases are done," said Bruce Fein, an attorney with the conservative Heritage Foundation, and as he saw it Mr. Brennan had marshaled the court more skillfully than any chief justice in history.

"Rehnquist has been inept with regard to court politics," he added, saying that the chief justice "has played his hand so poorly I can't see him pulling together a coalition." The court this term has issued far fewer splintered opinions, Mr. Fein said, and they have been clearer and shorter. He believes this means that Justice Brennan has been able to forge majorities without sacrifice to content.

Throughout the term that Rehnquist dissented where Burger might have joined the majority to write a narrower opinion. "That has produced clearer and more enduring victories for liberal constitutional principles in a range of areas than would have otherwise been the case," Mr. Fein said.

Fred Astaire, a Paragon Among Dancers, Is Dead

LOS ANGELES — Fred Astaire, 88, whose debonair elegance and flowing, graceful style made him the most acclaimed dancer in movie history, died Monday of pneumonia in Los Angeles.



Fred Astaire performing a dance routine on skates in 1937.

Airports Fear Solicitation Abuses

After U.S. Ruling, Ersatz Priests Collar Travelers Legally

By Robert Lindsey New York Times Service LOS ANGELES — Wearing a black suit and clerical collar, James Wright stands daily near an escalator at Los Angeles International Airport, and on a good day he collects \$150 or more in the cigar box he extends to passengers.

Mr. Wright is not a priest, but he wears a small badge identifying himself as a minister of the Universal Life Church, a mail-order organization in Modesto, California, that issues "ordinations" in exchange for a contribution of a dollar or two. For \$5, the organization confers sainthood by mail.

Restrictions have been placed on solicitors at some airports. In Atlanta, for example, they must stay in booths just beyond the path of passengers. But airport officials say that the First Amendment hampers them in trying to halt the cheating of passengers and other abuses.

Topper, Cane, Charm By Richard F. Shepard New York Times Service Mr. Astaire danced his way into the heart of America during the Depression. His deceptively easy light-footedness, warm smile, top hat, cane, charm and talent made people forget the harsh world outside the movie house.

'A guy dressed like a priest in a busy place like an airport can take in \$100, \$150 a day.' — James Bradford, United Mission Church

A Stillness Lingers in Chernobyl

By Celestine Bohlen Washington Post Service CHERNOBYL, U.S.S.R. — Less than a mile from the Chernobyl nuclear power plant stands a dead forest. Where there were once more than 70 acres of pine trees, now there are only spindly trunks, stumps of needles, tinged a strange rust color.

In human terms, the accident has been officially documented: 31 dead, 237 initially hospitalized with acute radiation sickness, 135,000 people evacuated from towns and villages in the contaminated zone that extends from the Ukraine into the Belorussian republic. Soviet experts agree that thousands of deaths will occur over generations because of the lingering effects of radiation. How many, nobody knows.

See ASTAIRE, Page 6

See AIRPORT, Page 6

See NUCLEAR, Page 6



# U.S. Case of a Retarded Murderer Raises New Death Penalty Quandary

By Ruth Marcus  
*Washington Post Staff Writer*

CONWAY, South Carolina — Minutes after the decision, the guards brought Limmie Arther, a convicted murderer with an IQ of 65, to a small back room in the Horry County jail to talk with his lawyer.

Experts on mental retardation had spent the day testifying that Mr. Arther, 28, the son of a sharecropper, had the mental ability of a child 10 to 12 years old, at best. They had said he could not remember his lawyers' names or recite the alphabet.

Last month Mr. Arther was sentenced to die in South Carolina's electric chair for killing his crippled 65-year-old neighbor with an ax while watching his Social Security retirement benefits. On Friday, the judge who had imposed the death sentence refused a defense plea to reduce Mr. Arther's sentence to life in prison or grant him a new trial.

One of Mr. Arther's lawyers, John Blume, asked him how he felt about the result.

"I ain't too sure," Mr. Arther said, smiling. "I feel good anyway," he said, adding: "Got a new trial. Limmie, he didn't give us a new trial." The lawyer replied, wincing. "This means we're going to have to appeal it. You know what appeal means?"

"Yes, sir," nodded Mr. Arther. The case of Limmie Arther poses the troubling question of whether the death penalty may be imposed on murderers who are mentally retarded — or whether their execution should be barred, as Mr. Arther's lawyers contend, under the U.S. Constitution's Eighth Amendment, which prohibits cruel and unusual punishment.

"It's just wrong to execute people whose understanding of the world is that of children," said Mr. Arther's chief lawyer, David Bruck. "The death penalty is an absolute punishment," he said. "And if it is to be imposed at all, it should be imposed on people whose sense of responsibility and judgment is such that they fully appreciated the seriousness of what they were doing."

But prosecutors in Mr. Arther's case, and other advocates of capital punishment, argue that, as long as mentally retarded offenders understand the criminality of their acts and are competent to stand trial, their low intelligence should not shield them from execution.

"There is an abundance of evidence in the record to show the defendant knew what he was doing. That record includes five house break-ins and his guilty plea to involuntary manslaughter in the stabbing death of his older brother,

## U.S. Amnesty Group Seeks End to Penalty

*United Press International*

SAN FRANCISCO — Amnesty International USA has decided to seek an end to the death penalty, which speakers called a violation of human rights and "a surreptitious expression of racism."

The international group, which won the Nobel Peace Prize in 1977, is best known for its efforts to end human rights violations around the world.

But its U.S. director, John Healy, told 1,000 American members at the group's annual meeting that capital punishment is the ultimate violation of human rights and should be abolished.

He called for an end to capital punishment in the United States.

"We should know that when the death penalty enters any country in the world, then the minorities who live there should be scared because it will be used against them — as it has been used in this country against blacks," he said Saturday.

An Amnesty International staff member, Charles Fulwood, said the death penalty, as practiced in the United States, is "a surreptitious expression of racism" because statistics show that a disproportionate number of blacks receive it.

Mr. Healy said the group would first oppose the death penalty in Florida, Texas, Louisiana and Georgia because most executions in the United States take place in those states. He added that Amnesty International would work with the NAACP and the American Civil Liberties Union.

capital punishment was reinstated. At least five were diagnosed as mentally retarded or borderline. But the issue of their mental capacity was raised too late in the process to stop their execution.

Mr. Arther is the 17th of 18 children raised in a tiny, tin-roofed shack amid the tobacco fields of rural Duford, near Myrtle Beach.

The crime for which he has been sentenced to death occurred on New Year's Eve, 1984. Mr. Arther's sister, Marilyn, drove him into town along with William Miller, who was known as Cripple Jack, and Mr. Miller's wife, Katie. Mr. Miller cashed his Social Security check, paid some bills and bought two half-pints (about a half liter) of liquor, which he and Limmie Arther drank behind a local store.

Marilyn Arther dropped her brother and Mr. Miller at Mr. Miller's house. Limmie Arther said he was going to chop some wood. When Mr. Miller's wife returned a few hours later, her husband was dead. A bloody ax was lying nearby. In a washbasin outside the Miller Arther's bloodstained shirt. At the Arther's home, they discovered Limmie hiding in the attic, his bloody boots sticking out of the rafters and \$100 in his wallet.

When questioned, Mr. Arther first told the police that he earned the money selling peaches, then switched his story and told them he stole it from his father. When Limmie Arther disputed that, Limmie changed his story again and said he had taken the money from Mr. Miller earlier that day.

Mr. Arther did not testify at his trial.

To prosecutors, the fact that Mr. Arther hid after the murder and lied to the police demonstrate that he understood what he had done.

"If he didn't understand the criminality of his act after he killed Cripple Jack Miller," said Ms. Owens, the prosecutor, "he wouldn't have had the sense to go hide in the attic or the ability to create a story and to change it."

From the defense viewpoint, Mr. Arther's attempt to escape responsibility by hiding and lying is evidence that he is not a savvy, street-smart criminal.

"He took his bloody shirt and left it soaking at the scene of the crime," said Mr. Bruck. "There he is, hiding in the attic with his feet sticking out. Good grief. If that's the crime of a mature criminal, I think the job of our law-enforcement agencies would be a great deal easier than it is."

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**An Honor for Nancy Reagan**

Mikhail Baryshnikov, the ballet star, dancing with Nancy Reagan in Washington during the Ford Theater's festival ball. She was presented with a medal for her support of the theater.

## Group to Patrol N.Y. Subways

By Esther Iverem  
*New York Times Service*

NEW YORK — Twenty-five young black men began patrolling the city subway system Sunday in an effort to curtail crime that they believe disproportionately affects the black community.

The organizers of the patrol said that the unarmed volunteers will patrol all subway lines from 6 P.M. to 6 A.M. daily and will intercede when they see crimes against the members of any race.

They said the patrol said it began in response to the acquittal last week of Bernhard H. Goetz, 39, in the shooting of four persons on a subway train. Mr. Goetz said he shot them because he believed they intended to rob him.

Mr. Goetz is white and the four young men shot are black. A U.S.

## Oratorically, a Democratic Agenda Takes Shape

By E.J. Dionne Jr.  
*New York Times Service*

WASHINGTON — The Democrats who would be president have found a new political language.

Instead of talking about "spending," they propose "investments in the future." They hate the word "taxes," preferring, when they have to, to speak of "new revenues." And they have dropped themselves in red, white and blue, seeking to blend the theme of compassion with patriotism, optimism and toughness.

But beneath the words is a substantive consensus that is coming to be called the "post-Reagan agenda."

Although it is not yet complete, the emerging platform includes a renewed commitment to public education, a focus on the needs of children, calls for a more competitive but also more cooperative economy, efforts to create a welfare system that emphasizes work and job programs, and an aggressive attack on what they describe as the culture of selfishness.

The Democrats' move toward consensus on domestic policy has not yet been matched by a similar agreement on foreign policy.

But on domestic issues, there is surprising agreement on themes, an accord that stretches from the Democratic Leadership Council on the party's right and center to Americans for Democratic Action at its liberal wing.

Underlying the Democratic consensus is an emphasis on words

such as "community," "citizenship" and "obligation."

The Democrats say that after seven years in which the national credo emphasized the potential and achievements of the individual, the nation is prepared to turn toward a sense of the "public good."

"There's a sense that something is missing," said Representative Richard A. Gephardt of Missouri, one of the presidential candidates. "There's been this worshiping of doing well individually, but it is not allowing us to do well individually or as a nation."

"What we missed in all this, and what the country is beginning to understand, is that human issues, a sense of community, treating everybody decently, is vital to our success," Mr. Gephardt said.

William Schambra, a conservative scholar at the American Enterprise Institute, argues that the Democrats' rhetorical strategy is not new and that liberals have long tried to stress a sense of "national community" as against the conservatives' preference for "local community."

But new or not, the locations are giving the party the opportunity to look unified.

Emphasizing one form of patriotism, former Governor Bruce Babbitt of Arizona, another presidential candidate, speaks of his efforts in the war on poverty. Other Democrats discuss the obligations of "citizenship."

Such language helps solve what Governor Bill Clinton of Arkansas, who is contemplating entering the Democratic contest, has called "the great dilemma for Democrats: how to speak to the possessed and the dispossessed at the same time."

When he was governor of Arizona, Mr. Babbitt pioneered efforts to provide child care at a reasonable cost. In recent weeks, Senator Joseph R. Biden Jr. of Delaware, who is also running, has devoted

more and more attention to children's programs, and other Democrats are following suit.

The economy is another area in which the Democrats are speaking of innovation and compassion. Although they have criticized Japan for its trade policies, many Democrats say the United States needs to learn from Japan's cooperative style of business management.

The Democrats have also taken their party's historic commitment to the rights of workers and refashioned it with an emphasis on "incentives." They praise companies that give workers bonuses and shares of profits and criticize those that give bonuses only to executives.

At the same time there is broad agreement that economic innovation will cost jobs in certain parts of the manufacturing and service industries. Thus, all the candidates talk of the need for expanded training of displaced workers.

Job training, as well as education, again emerges as a theme when the Democrats talk about changing the welfare system.

The candidates believe that most voters favor job training and education programs for the poor, provided that these programs move people off the welfare rolls.

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The Reverend Jesse Jackson, who has not yet announced his candidacy, draws loud applause for his attacks on "merger maniacs," a reference to financiers and Wall Street brokers. Mr. Babbitt emphasizes the difference between entrepreneurs who move "paper" and workers who build the nation's strength.

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OPINION

When Helms & Co. Pursue Policy by Wrecking-Ball

By Philip Geyelin

WASHINGTON — What with the Boland amendment and Nicaragua, or the War Powers Act in the Gulf, one year after a clear-cut case to sharpen the mind-bending debate over the respective roles of Congress and the executive in the making of foreign policy.

Helms's current target is '100 percent guilty' of supporting U.S. policy.

east coast of Africa, scarcely qualifies as a top-priority U.S. security concern. But even as a microscopic case study, this one has macro-implications that only begin with the men-minded mischief-making of Senator Jesse Helms of North Carolina or the ideological hooliganism of the far right.

introduce economic and social reforms, and reach out to the West. The results fall well short of a break with Moscow or Marx. But they were sufficiently impressive to bring an invitation to the White House for Mr. Machel from Ronald Reagan in 1985.



LETTERS TO THE EDITOR

The Iran-Contra Affair: An Issue of Legal Boundaries

Regarding the opinion column "Congress Is Invading the President's Space" (May 27) by George F. Will: The Reagan administration now argues that the Boland amendment [restricting U.S. support for the Nicaraguan rebels] did not apply to the president or the National Security Council. This sounds like a prelude to yet more damaging revelations.

Regard for Earth's 'Crew'

I find Jonathan Power's opinion column, "Population: Don't Be Frightened by the Numbers" (April 27), to be a very narrow analysis of the problem raised by the world's galloping birthrate.

The 'Perfect' Dad's Day Gift: An Embarrassment of Riches

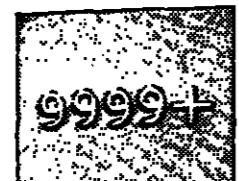
By William E. Geist

NEW YORK — "Subway Vigilante" is a lovely song with a nice melody and a real folk quality. It was written by Ronald Gold, whose group recorded the number, subtitled "The Ballad of Bernhard Goetz." "It is sing-

MEANWHILE able, hummable and danceable — the perfect Father's Day gift." Mr. Gold is the lead singer of Ronnie & the Urban Watchdogs, a yet to be popular group. He had about 500 records on hand for Father's Day but rush-ordered 10,000 more after the acquittal of Mr. Goetz of all but one charge.



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Nations in Region Are Distancing Themselves From Reagan

By William Branigan Washington Post Service
TEGUCIGALPA, Honduras — As the Iran-Contra affair drags on in Washington, the prospect of a weakened Reagan administration is causing increasing nervousness in Honduras and other Central American countries...

Habit. Mr. Arias rejected treaties that the plan be amended to include a call for negotiations between the Sandinista government and Nicaraguan rebels.
A Central American summit meeting to discuss the plan was postponed from June 25 until early August...

6 Die as Boat Sinks in India
NEW DELHI — Six persons were drowned and more than 30 were missing after a boat carrying at least 81 people sank Monday in a river near Manipalpur in West Bengal state...



Wreckage of a vintage Bristol Blenheim lies on a golf course near London.

Golf Course Claims a Bristol Blenheim

LONDON — The dreams of a group of aircraft restorers lay in ruins on an English golf course Monday after the only flying example of a World War II Bristol Blenheim fighter-bomber crashed-landed.

Earl (Madman) Muntz, Zany Car Dealer, Dies

RANCHO MIRAGE, California — Earl (Madman) Muntz, 73, whose zany ads for used cars were the butt of jokes by radio comedians, died Saturday of lung cancer.

ASTAIRE: Dancer Dies at 88

ASTAIRE: Dancer Dies at 88 (Continued from Page 1)
dancer, not necessarily because of his voice but by his conception of projecting a song.

TUNISIA: Role of Islam Is at Center of Ferment

(Continued from Page 1) minister who is the most prominent leader of the secular opposition.
And this repression only encourages the most fanatical and extremist trends.

Save 40% or more off your newsstand price when you subscribe for 12 months to the International Herald Tribune.

COURT: Brennan in Charge

(Continued from Page 1) ently was designed to appeal to someone," Mr. Tribe said.
He doesn't seem to be attracting justices to his corner," Mr. Tribe said.

NUCLEAR: A Stillness Haunts Towns Near Chernobyl

(Continued from Page 1) Officials bristle at the mention, and dismiss the reports as "subjective" reporting, based on rumors.

Penalty Is Upheld In Bolles Murder

WASHINGTON — The U.S. Supreme Court reinstated Monday the death sentence of John Harvey Adamson, convicted in the 1976 bombing murder of Don Bolles, an investigative reporter for The Arizona Republic.

KOREA: Chun Makes Concessions

(Continued from Page 1) plans Monday to Mr. Roh and other ruling party officials. Moreover, important details that could affect the success of any of the overtures were not made clear.

AIRPORT: After Ruling, Fears of Solicitation Abuses

(Continued from Page 1) ing over territory at the airport," said Maurice McDonald, manager of Lindbergh Airport in San Diego.

Subscription information for International Herald Tribune, including rates for various countries and contact details.

BEIRUT: Release Rejected

(Continued from Page 1) freed in the foreseeable future. If at all.
President Hafez al-Assad of Syria, with 7,000 of his troops deployed in the West Beirut area, has sent a senior officer to Beirut to intensify Syrian efforts at freeing the hostages.

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ARTS / LEISURE

Kassel's Disappointing 'Documenta'

By David Galloway
KASSEL, West Germany — Located within pea-shooting distance of the East German border, this seems an improbable destination for the cultural pilgrimage.

want to take art marathons in stride. The Fridericianum, too, reflects the changing times. The recent and radical renovations have produced a warren of concrete halls and cubicles that would better serve as the bottling-plant for a local brewery.

Few will have the Brothers Grimm Museum as their goal, and fewer still the nation's only wallpaper museum or the bizarre wood museum. Those are year-round attractions, but the mammoth art spectacular called Documenta is staged only twice a decade.

By ripping out the massive central staircase, the renovators deprived the Fridericianum of any architectural logic. The upper stories are reached via a series of side staircases that often end in blank walls.

Sculptures and installations are scattered throughout the city, but the real nucleus of Documenta 8 is found in two historic buildings: the Museum Fridericianum and the Orangerie. The former witnessed the birth of Documenta in 1955, as an attempt to close the modernist gap the Nazis had left behind.

Theoretically, at least, Documenta 8 should demonstrate that this, in doing so, it understandably excludes the gestural, autobiographical, neo-Expressionist works that dominated Documenta 7.

The spirit of improvisation and discovery lent the early Documentas a dynamic that can hardly be recaptured today. Audiences are better informed, harder to shock, and

The relevance to society is perhaps best illustrated by a new generation of sculptors who have adapted the form-language and materials of architecture — by definition, a more "public" medium.

Nonetheless, there are refreshing discoveries to be made, and most of those in the form of video or electronic installations. The American Jenny Holzer has produced a mausoleum-like setting: a pair of granite slabs bearing the same "home truths" that run over digitalized light-boards mounted veridically on the wall.

photograph. There is no European video artist who commands this virtuoso mastery of craft. Even Nam June Paik, who presents a superb video homage to Joseph Beuys, seems quaintly old-fashioned in comparison.

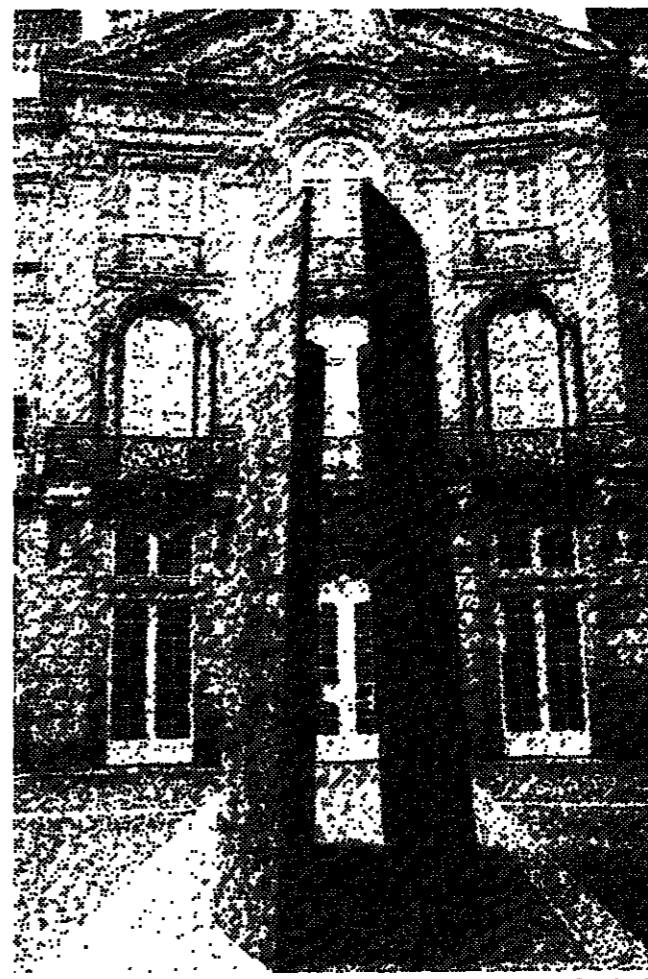
Beuys's provocative posturings might have lent this exhibition the cutting edge it lacks. Yet the great shaman is not entirely absent. In addition to Paik's tribute, there is an impressive ensemble of bronzes cast from Beuys's last major installation, "Lightning with Stag in its Glare."

Richard Serra's work has never looked more eloquent or persuasive than it does before the baroque palace of Erdrostenhof. And on the lawn beside the local music school, Keith Haring's familiar mottos at the sky. It is the graffiti artist's first major venture into sculpture.

Wandering in the city, map in hand, or renting a bicycle to see the artistic sites, visitors can regain the sense of discovery that was once synonymous with Documenta.

"Documenta 8," until Sept. 20. "Sculpture Projects Münster," until Oct. 4.

David Galloway is a writer and professor based in West Germany.



Serra's "Trunk," eloquent at the Münster sculpture festival.

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Cantonese Opera, Caught Between Past and Future

By Nicholas D. Kristof

HONG KONG — A 72-year-old who still exults in his back flips, Sun Matsui is the lord of Cantonese opera. An energetic man whose hands flutter through the air as he speaks, Sun packs theaters with his fans, who are often so overwhelmed with his grace and singing that they throw rings and necklaces and money upon the stage after a performance.

one of the world's greatest civilizations, attract today's generation of denim-clad Chinese, seduced by Western songs, films and way of life?

To a foreign ear, Cantonese opera may be a musical experience rivaled only by a classroom of second-grade maestros scratching their fingernails on a blackboard. Yet, if the singing is an acquired taste, the grace and subtlety of movement impress even the most callow observer.

Like its northern cousin, Peking opera, Cantonese opera combines a libretto that borders on poetry with magnificent costumes and choreography. The movement and makeup in Cantonese opera, however, often seem more natural than those of Peking opera. And Peking opera is performed in Mandarin Chinese instead of the Cantonese dialect spoken in Hong Kong.

Older people in Hong Kong still love Cantonese opera, and prize it as the bulwark of traditional culture. Its heyday, in fact, came during this century, from the 1920s to the 1950s. At a government-subsidized performance this month in a Hong Kong gymnasium, operagoers, many of whom could remember foot binding and Imperial China, began lining up more than an hour before the performance and filled every nook of the auditorium.

Young people spurn Cantonese opera partly because of its complexity and subtlety — which, to others, are its virtues. Every gesture, every swish of a long white sleeve, every tint in the painted face conveys meaning. A whip in the hand means that the actor is riding a horse; a red face suggests righteousness and a white face, craftiness.

Therefore the dilemma for Cantonese opera is whether to maintain traditional purity, or to make opera more accessible by modifying it. In essence it is the same question that Western culture faces: Should Shakespeare be translated into a modern idiom, or can an Italian opera be performed in English? Without adaptation, traditional cultural achievements — such as Tang Dynasty poetry in China or Ovid's Metamorphoses in the West — tend to wither in influence.

The quandary may be particularly acute in the Chinese world, where conformity to artistic tradition plays a greater role than in the West. Chinese painters, for example, traditionally copied the exact works of their masters over and over.

In the United States, it sometimes seems as if every 25-year-old director feels obliged to interpret Sophocles in a radically new way, often a tribute more to imagination than to judgment. In the Chinese world, on the other hand, the strict feels obliged to follow his elders.

Cantonese opera, which dates from the first half of the 18th century, has changed in some ways. Early in this century many libretti were written in colloquial language. Western instruments are sometimes found in the orchestras. Sets are more elaborate, and microphones are common. "It is good to change, to keep good elements while allowing others to die out," said Lemng Pui-kam, an expert on Chinese opera at the Chinese University of Hong Kong.

Cantonese opera originated with troupes who wandered from village to village, performing in the streets or in teahouses. Even today, Cantonese opera is more the Oriental equivalent of vaudeville than of Western opera. In Hong Kong, an opera is a casual evening out, to which the Chinese wear old clothes and perhaps gnaw on a chicken foot during the performance.

Western opera connotes sophistication, so people might feign enthusiasm even if they do not feel it. But the folding chairs, constant chatter and discarded chicken bones in the audience of Cantonese opera suggest to some young people a legacy that is more embarrassing than inspiring.



Every tint in the make-up conveys meaning.

Today the greatest cultural stars in the Chinese world are pop singers like Alan Tam and Anita Mui, whose rock music is based on Western and Japanese styles; or celluloid heartthrobs like Jackie Chan, a martial arts expert who is Hong Kong's most eligible bachelor. Cantonese opera buffs scoff at the crooners, just as devotees of Bartók or Brahms may be put off by Bruce Springsteen or Barbra Streisand.

For all of the obstacles facing Cantonese opera, there does seem to have been a modest revival in the last few years. Last year, for example, some 22,000 people attended performances in the New Territories section of Hong Kong, up from 15,000 a year earlier. A few new troupes have also been organized. But even opera singers say that the principal reason for the revival is increased support from local governments.

While some young performers study Cantonese opera, there are no sweeping attempts to reinterpret the medium. Few new libretti are written today, and no Arthur Miller has appeared to substitute modern themes and everyday people for the old folk tales, kings and generals that usually dominate the operas. Even the younger students of Cantonese opera sometimes regard it as only a slightight.

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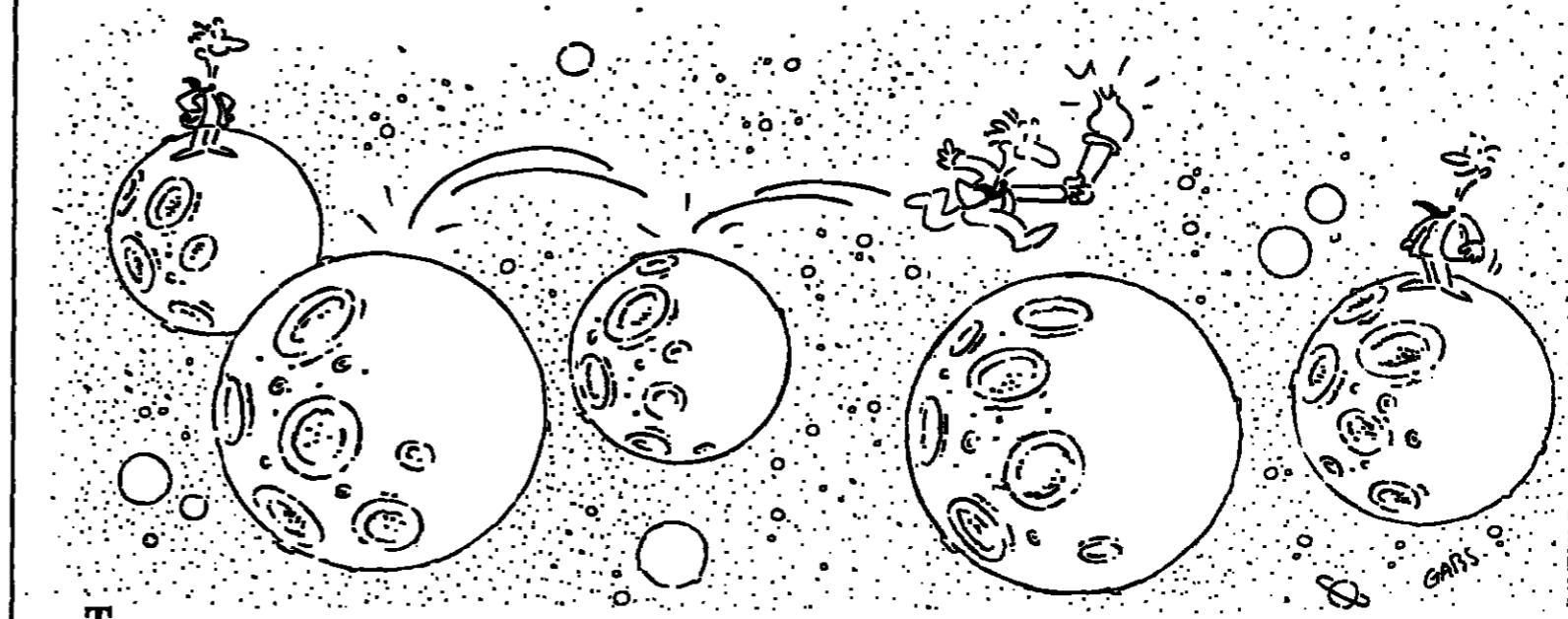
WARDEN, IS THERE PART OF MY SENTENCE I'M UNUSUALRE IN UNUSUALRE OFF.

Pyramid Corridor Find

CAIRO — Japanese researchers may have found part of a corridor leading to the queen's funerary chamber in the Cheops pyramid, the semi-official Al Ahram daily said on Monday. Al Ahram quoted the head of the Egyptian Antiquities Office, Ahmed Kadri, as saying that the discovery was made by a team from Tokyo's Waseda University, and had revealed the existence of a cavity near the queen's funerary chamber. The researchers used an electro-magnetic device to sound the depth of the pyramid as far as 10 meters (33 feet) deep. A more sophisticated device capable of sounding the depth of the pyramid as far as 100 meters was needed to confirm the finding. Kadri added that Egyptian scientists would meet with officials of the Ministry of Scientific Research to discuss the future of these findings "considering the importance they represented."

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NYSE Most Actives table with columns for stock symbol, volume, high, low, and change.

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NYSE Index table showing high, low, close, and change for various indices.

Monday's NYSE Closing logo and text: Via The Associated Press

AMEX Diary table with columns for stock symbol, close, and previous price.

NASDAQ Index table with columns for close, previous price, and change.

AMEX Most Actives table with columns for stock symbol, volume, high, low, and change.

Dow Jones Bond Averages table with columns for bond type, close, and change.

NYSE Diary table with columns for close, previous price, and change.

Odd-Lot Trading in N.Y. table with columns for date, buy, and sell.

Dow Jones Averages table with columns for high, low, close, and change.

Standard & Poor's Index table with columns for high, low, close, and change.

NASDAQ Diary table with columns for close, previous price, and change.

AMEX Stock Index table with columns for high, low, close, and change.

Tables include the nationwide prices up to the closing on Wall Street and do not reflect late trades elsewhere.

Large table of stock prices (A) with columns for 12-month high/low, stock symbol, div., yield, P/E, 52-week high/low, and close.

Dow at Record as Buyers Return

United Press International NEW YORK — Prices on the New York Stock Exchange continued their advance Monday as buyers returned to equities after two weeks of hesitation...

Large table of stock prices (B) with columns for 12-month high/low, stock symbol, div., yield, P/E, 52-week high/low, and close.

Large table of stock prices (C) with columns for 12-month high/low, stock symbol, div., yield, P/E, 52-week high/low, and close.

Large table of stock prices (D) with columns for 12-month high/low, stock symbol, div., yield, P/E, 52-week high/low, and close.

Large table of stock prices (E) with columns for 12-month high/low, stock symbol, div., yield, P/E, 52-week high/low, and close.

Large table of stock prices (F) with columns for 12-month high/low, stock symbol, div., yield, P/E, 52-week high/low, and close.

NEW NEW NEW NEW NEW ENTERTAINERS GOLD advertisement with logo and text.

Large table of stock prices (G) with columns for 12-month high/low, stock symbol, div., yield, P/E, 52-week high/low, and close.

Large table of stock prices (H) with columns for 12-month high/low, stock symbol, div., yield, P/E, 52-week high/low, and close.

Large table of stock prices (I) with columns for 12-month high/low, stock symbol, div., yield, P/E, 52-week high/low, and close.

Large table of stock prices (J) with columns for 12-month high/low, stock symbol, div., yield, P/E, 52-week high/low, and close.

Large table of stock prices (K) with columns for 12-month high/low, stock symbol, div., yield, P/E, 52-week high/low, and close.

Large table of stock prices (L) with columns for 12-month high/low, stock symbol, div., yield, P/E, 52-week high/low, and close.

(Continued on Page 16)



# Technology Quarterly

Issue No. 1

## DEPARTMENTS

### Research 11

New York to Tokyo in three hours? More than fantasy, that is what aerospace experts are planning with the superfast hypersonic planes of the future.

### Developments 12

In a thermonuclear war, detection of noise produced by the propeller of a single missile submarine could prevent the destruction of scores of cities. That's why a recent sale of Japanese technology to Moscow has helped sour U.S.-Japanese relations. The details.

### Workplace 13

For Sweden's highly innovative automobile industry, the manufacturing system of the future will be built on a lesson from the past: the human factor is the key to performance.

### At Home 14

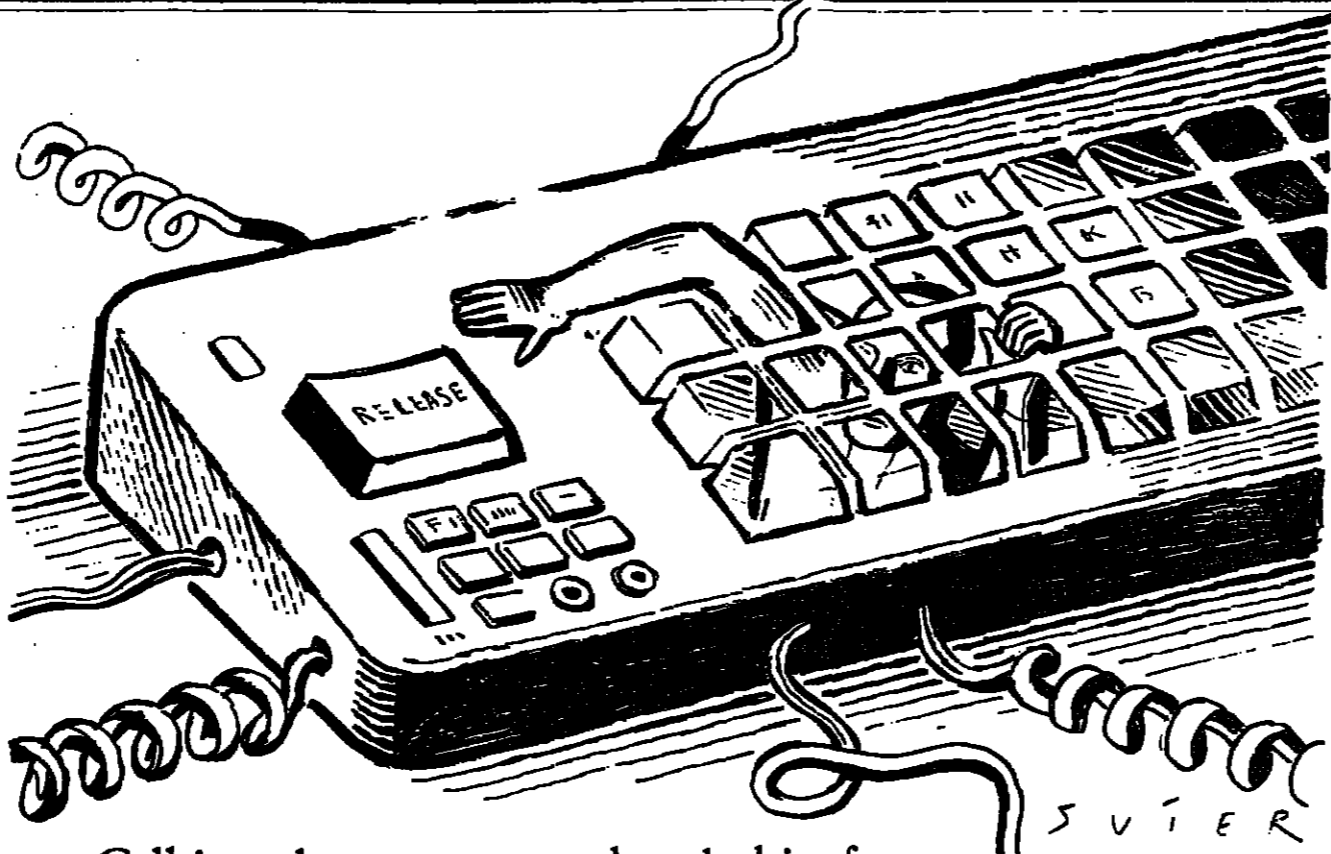
Just when you thought you had the very latest in audio-video equipment, you're hopelessly out of date. The latest must-have product: compact disc video.

### Interview 11

To most mortals, the limits of space are as short as the imagination. To Patrick Baudry, a French astronaut, the concept of conquering space is as long as several millennia and defined only by the limits of the human mind.



Down to Earth: Patrick Baudry signing autographs.



Call it techno-stress or cyberphobia, for low-tech man, it can be catastrophic.

## As the Dream Machines Arrive, So Do the Neural Nightmares

An Essay  
By Curt Supplee

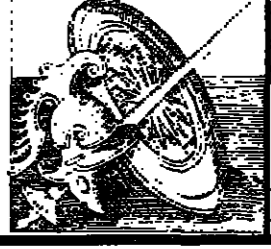
**W**E HAVE SEEN the future and it hurts. Thanks to the high-tech explosion, we are suddenly up to our nose cones in alarm watches, car phones, beeper pagers, portable TVs, automated teller machines, talking cameras, speed-grub vendors, electronic mail, microwave chow-blasters and computers. No wonder we are twitching like lab rats. Our offices are now "open architecture" caverns bristling with "privacy" panels; the venerable desk a "workstation"; the principal tool a video display terminal. Everything that isn't beeping is getting ready to hoot, bong or buzz. Everything that isn't running too fast is either broken or out of date. The net result is a neural nightmare. Call it techno-stress or cyberphobia, for poor low-tech man, an amiable hominid still getting used to walking erect, the strain can be catastrophic. It wasn't supposed to happen that way. Back in the optimistic 1950s, when the phrase "labor-saving device" was uttered in tones of grateful reverence, it was assumed that our pululating technological progress would produce a self-defrosting nirvana of unprecedented leisure. What we got instead was a sort of historical bait-and-switch: In place of a gizmo paradise of "spare" time, we found ourselves forced to cram more events into the same interval at the behest of high-speed machines that are increasingly incomprehensible. Which may explain why you are having trouble concentrating these days. The combination of more and briefer events arriving at ever-diminishing intervals constitutes a vast behavior modification pro-

gram, making the threat of shortened attention span a self-fulfilling prophecy. According to a University of California Los Angeles research team, concentration suffers most in tasks where people are required to interpret new events by comparing them to events in short-term memory, and where new events occur rapidly. Time pressure compounds the problem. Hence the agonies of air traffic controllers. And yet that is also a fairly accurate description of modern life. You are flipping between programs on your PC when the phone rings — a voice-synthesizer solicitation for radar detectors. But you are interrupted by the call-waiting tone. It's your doctor calling from his car phone with the results of your CAT scan. Your blood pressure hits max just as your pager begins to beep. Up to a point, stress works to our advantage, generating brain chemicals such as dopamine and norepinephrine which enhance our attention capabilities. But when the input is too great, the system crashes. And here in the silicon decade, says Dr. Mardi J. Horowitz, director of the Center for the Study of Neuroses at the University of California San Francisco, we may be approaching overload. "When a person is presented with a stimulus, especially one that is jangling in some way, a series of conceptual and emotional processes are set in motion," he said, at both the conscious and unconscious levels in "multiple channels of consideration." But when the next jangle comes too soon, the flow is blocked.

Continued on page 10

## Live-in-Bed Research Prepares Spacemen For Flight to Mars

Experiment simulates long-term exposure to weightlessness.



By Kathy Sawyer

**W**ASHINGTON — At a special facility in Moscow, a dozen healthy volunteers have just completed one year of lying down — and in fact living — in bed at a 6-degree, head-down slant. In the United States and France, other groups of volunteers have endured the same conditions for much shorter periods, ranging from a week to three or four months. These volunteers are guinea pigs in a most difficult, and increasingly crucial, area of space research: How do people stay healthy and able to function for long periods in the unnatural weightless environment of space? The search for answers to this question is intensifying, spurred by increased international interest in a manned mission to Mars, a voyage that will require humans to function in space for eight months in transit each way and, between, on the surface of Mars. Soviet officials have indicated that they intend to carry out such a mission early in the next century. In the United States, the independent National Commission on Space has recommended a manned Mars flight by the year 2015 and the government, although uncommitted, has stepped up its research.

"And the key thing is that we do not know the extent to which these changes will continue to progress over longer and longer periods of weightlessness." Reproducing the effects of weightlessness on the ground is difficult, he said. "The only effective way we have of doing so for long periods is to put people in the horizontal position." Researchers around the world have adopted the 6-degree, head-down slant as the best way to simulate many of the effects of weightlessness on the body, he said. The position is maintained using methods developed for chronically ill hospital patients, with the aid of a nursing staff. Volunteers are allowed to prop themselves up on one elbow to eat. They shower in a bed using hand-held nozzles, and they use bedpans, Mr. Billingham said. If they exercise, they do pushing or bicycling workouts in the prone position. Ames has conducted studies of up to a month, he said, and a bed rest program at NASA's Johnson Space Center in Houston

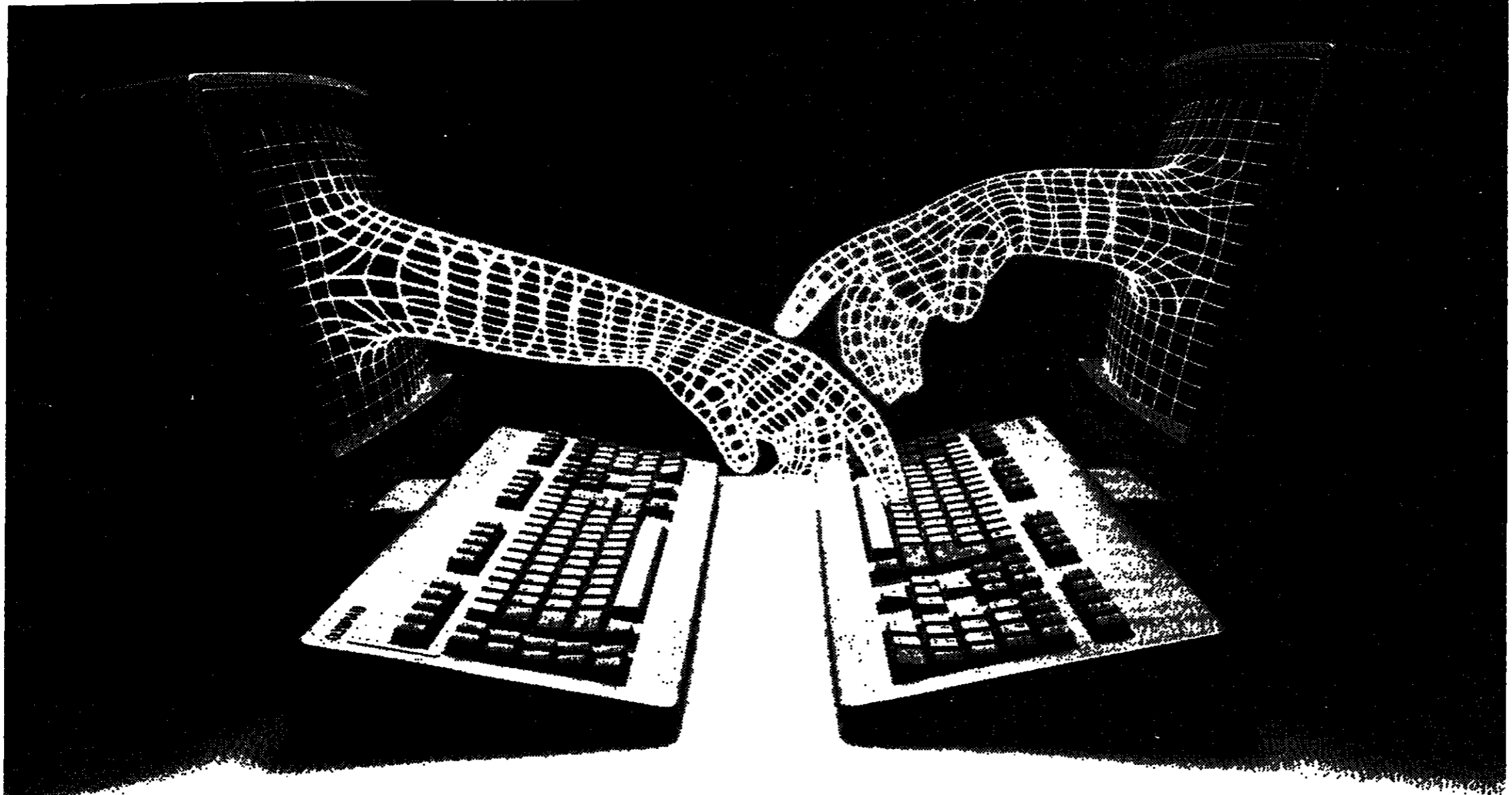
Continued on page 11

### To Our Readers

WITH this first issue of Technology Quarterly, the International Herald Tribune expands its coverage of the world of high technology. Four times a year, in June, September, December and March, Technology Quarterly will report on research, trends and developments — from home electronics to robotics, exotic new materials and beyond. In this issue, we explore man's (and woman's) ability to adapt to technology, at home, in the workplace and on the way to Mars. On Sept. 22: The next issue of Technology Quarterly will report on integrated systems for global manufacturing, computer applications in the art world, the new car models and more.

## The electronic factory: teaching machines to like one another.

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AEG has already brought to market stoves which "cook cold". These technological wonders are induction stoves which collect heat in the pot rather than the cooking surface. The stove turns itself off when the pot is removed or emptied. The result? Greater safety and appreciable energy savings.

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Electronic intelligence from AEG lets various machines in a manufacturing plant actually communicate with one another. We call it "flexible automation." And, just as with people, machines working together mean increased production, lower energy costs and improved quality. And the real people get to take up more challenging jobs.

# AEG

### Technology Essay

# As the Dream Machines Arrive, the Neural Nightmares Get Worse

Continued from page 9

"Some experiences are bumped out of the storage line. Some just remain because they are important and stressful, but they remain in an incomplete mode of processing," he added.

In time, he said, "people have larger and larger loads of unfinished business. When this gets too great, it begins to affect their subjective experience, interrupting concentration with intrusive images, their sleep with anxious wakefulness or troubled dreams, and their capacity to love and enjoy experience with an impatient restlessness to go on superficially to still the next thing."

We can't even cool down with our so-called leisure time consumables, since managing today's mega-tech chattels is itself a full-time job. Want music? You'll have to brave a multimodal stack of controls resembling the command deck at a nuclear power station — and understand scanning FM multiplexers, CD laser-readers, Dolby damping filters, super-tweeters and subwoofers.

Video? A living hell. The single most prevalent neurosis in middle-class life is "hook-up hysteria" caused by VCR machines: Everybody buys one, but nobody can install them. We use computerized hydraulic exercise ma-

chines that look like something out of Torquemada's back room; a Krups coffeemaker has a timer program you could use to run a NASA launch. In fact, the superfluity of choices is itself a major source of anxiety. Your ordinary clothes washer has several dozen option combinations; cable TV carries 72 channels; and by the time you've set the controls on that "relaxing" white-noise generator, you're too frazzled to listen.

Worse yet, devices that were once largely self-explanatory are now impenetrably baffling. Car dashboards look like an aerial view of Las Vegas at night. And woe to the yeoman who opens the hood. Gone is the familiar air cleaner, the venerable carburetor itself — replaced by a hydraulico-demonic tangle of injector hoses and turbo-tech that only an abdominal surgeon could love. Ditto for so many of the intuitively comprehensible gizmos of yesteryear.

"Any child of 50 years ago," writes Bernard Dixon, a microbiologist, in the journal of the New York Academy of Sciences, "looking inside a household clock, with its escapement and weights or spring, could see in a few minutes how it worked. A child of today peering at a digital watch can learn nothing." Consequently, he warns, we are developing a "black box" mentality — "an unease born of

the suspicion that events have actually moved beyond our power to affect or even to comprehend."

Nowhere is this more evident than in the very real neurophysiological strains of the modern workplace.

Several years ago, the National Institute for Occupational Safety and Health began to include psychological disorders on its list of leading work-related illnesses and has set a high priority on stress-reduction in U.S. offices. Among the top debilitators are classical work involving computers and video display terminals (VDTs), which, the institute found, produced a higher level of tension than air traffic control.

A new study from IBM's Watson Research Center shows that people still read faster and more accurately from paper than they can from virtually all computer monitors now in use. To achieve equal performance, IBM's research shows, users need CRTs with roughly twice the resolution now generally available.

But don't count on a new screen this year. Even at user-friendly AT&T, a company consultant conceded at a recent symposium, "it is difficult — often impossible — to reverse prior [production] decisions on the basis of human factors considerations."

Meanwhile, modular office designs and pri-

vacy panels cut employees off from wholesome social byplay, and because the technology favors discrete-task equipment run by specialists, workers get less variety and more machine-paced repetition. Thus, writes Philip Kraft in Computerworld, the "office of the future is no more than an attempt to make the office of the present look like the factory of the past."

**W**HERE that not enough, the beleaguered document-jockey is now beset by the most relentless surveillance in the history of corporate snooper. Thanks to cybernetic oversight, management can easily meter the precise number of minutes an employee works, tally breaks down to the millisecond, count outgoing phone calls and obtain an immediate readout of a worker's productivity compared to that of his colleagues.

Word-processing software can monitor how many keystrokes an operator expends on a given document and track the amount of time spent on revision. And several U.S. companies are now using programs that display selected messages on workers' computer screens, from pop-up "flash card" reminders to flickering subliminal suggestions that last only 1/100th of a second.

It is no surprise, then, that in the United

States workers' compensation claims based on job stress have more than doubled since 1980 and now account for about 15 percent of all occupational disease claims. A 1985 University of Georgia study of workers in 18 public and private sector organizations found that 45 percent suffered from some form of psychological burnout.

Recent surveys by the National Association of Manufacturers indicated that the highest stress ratings derived from lack of appreciation, job instability, social isolation at work and ambiguous job descriptions.

All this at a time when more is being asked of workers every year. "The more sophisticated we make our factories," said John Clancy, a president of McDonnell Douglas Manufacturing Systems Co., "the more dependent we become on the sophistication of people who run them."

Too bad. When it comes to scientific literacy, the average American ranks only slightly above gerbils. In a national survey conducted in late 1985, the National Science Foundation discovered that just 31 percent of U.S. adults comprehend radiation, 24 percent understand what software is and barely 20 percent think they know how a telephone operates. But don't count on it.

The study also found that 40 percent believe

alien spaceships have visited Earth and that there are such things as lucky numbers. The ratings are still lower for those aged 18 to 24, on whom the future of the U.S. economy will depend.

If the techno-speak doesn't change, perhaps we will. Since World War II, reports the February issue of the Human Factors Society Bulletin, "research literature has shown that, as time, research literature has shown that, as time, people's conceptual complexity increases, they become less authoritarian, more open-minded, have less need for structure and rigid rules, have greater tolerance for ambiguity and become more effective group problem solvers and decision-makers. This tends to be reflected in a dynamic, rather than static, view of the world, in more openness to change, and in a different set of attitudes towards work and organizational structures."

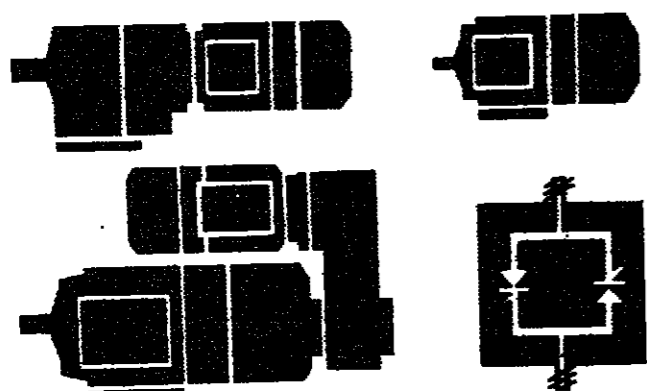
We'll need it. After three years of study, Active Office Systems, a U.S. research firm, has determined that workers are most productive, healthy and alert if they do their VDT work while walking on an electric treadmill. Whether the idea takes off remains to be seen. But it's a metaphor for our time.

CURT SUPLEE is an editor for the Outlook section of The Washington Post.

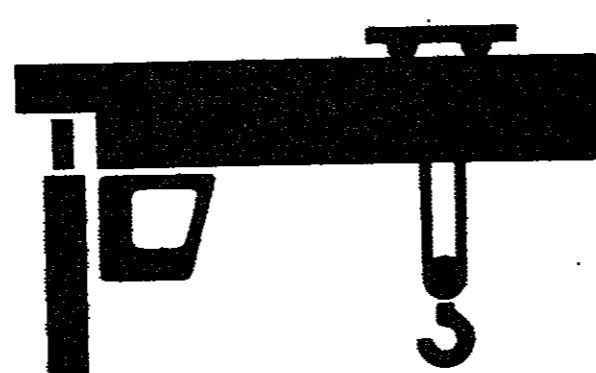
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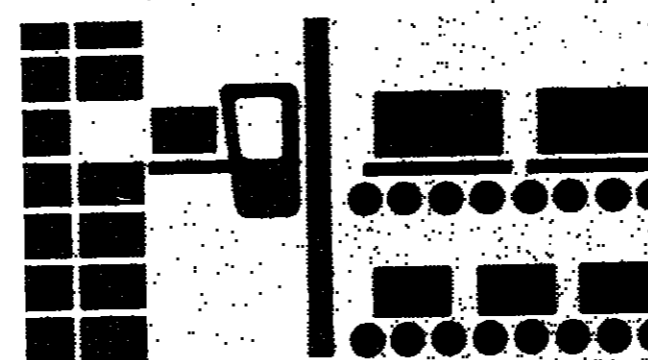
# Machinery, Plant, and Systems



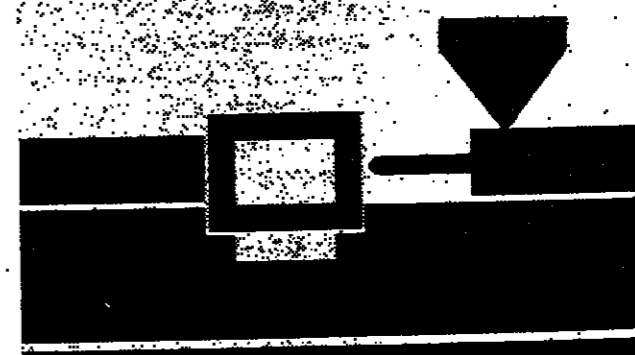
**Material handling components**  
Electric motors, control systems, hoists and travel units, control pendants, busbar lines



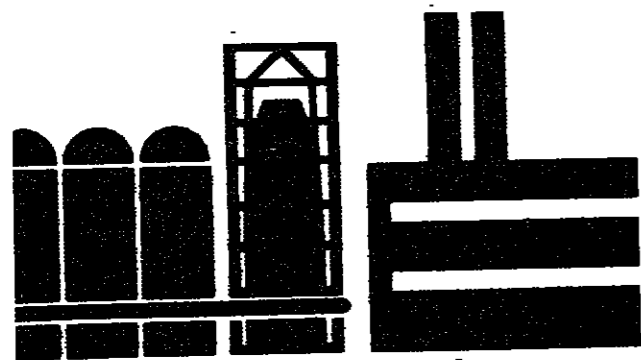
**Cranes and handling equipment**  
Cranes, load handling attachments, storage and retrieval machines, handling systems, controls



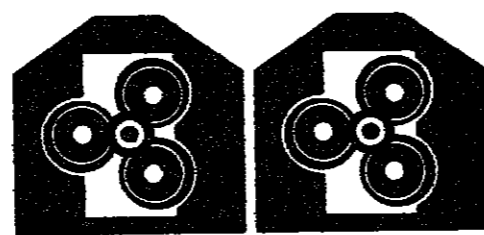
**Systems engineering**  
Storage, order-picking and material transport systems, planning and implementation of integrated material handling installations



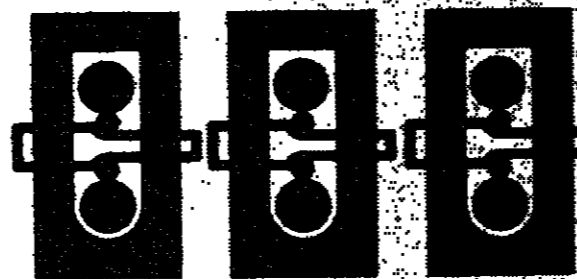
**Plastics machinery**  
Machines and integrated injection moulding systems



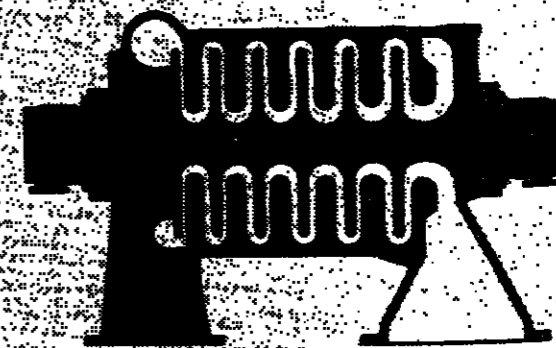
**Metallurgical plant and equipment**  
Integrated works, blast furnaces, steel-making shops, secondary steel-making equipment, continuous steel casting machines, electrometallurgical facilities



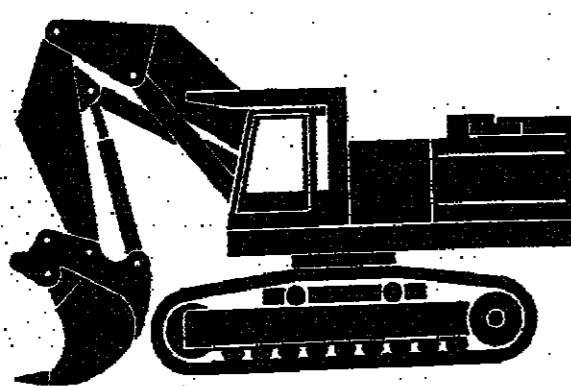
**Tube and pipemaking facilities**  
Plant and machinery for the production of seamless and welded tubes and pipes and hydraulic presses



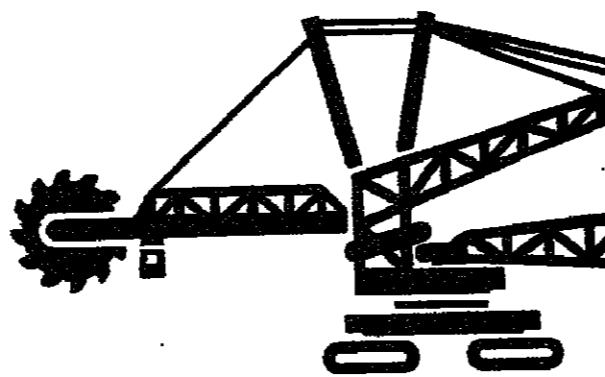
**Rolling mill engineering**  
Rolling mills for sections, beams, rod, strip, plate and sheet, and strip processing lines



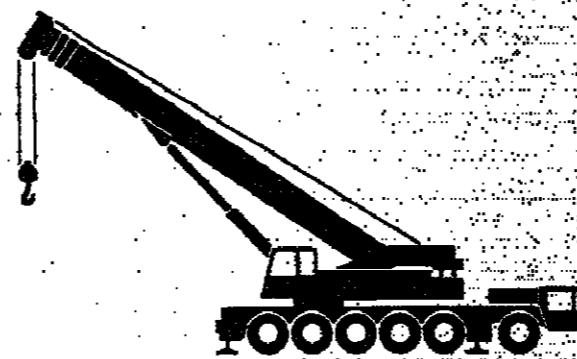
**Process gas compressors**  
Dynamic or positive displacement machines for air or industrial gas compression, and vacuum pumps



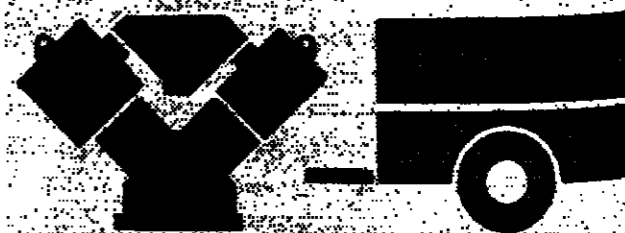
**Construction equipment**  
Hydraulic excavators, cable-operated hydraulic excavators, pavers, side finishers



**Mining engineering**  
Open-cast mining equipment, bulk handling equipment, large hydraulic excavators, tunnel-heading and shaft drilling machines, shaft winding systems



**Mobile cranes**  
Lattice-boom and telescopic cranes, pneumatic tyre- or crawler-mounted, harbour cranes, industrial yard cranes



**Pneumatic equipment**  
Compressors, equipment and components for the construction and manufacturing industries

NOTE: B...  
The Loew...  
Networking

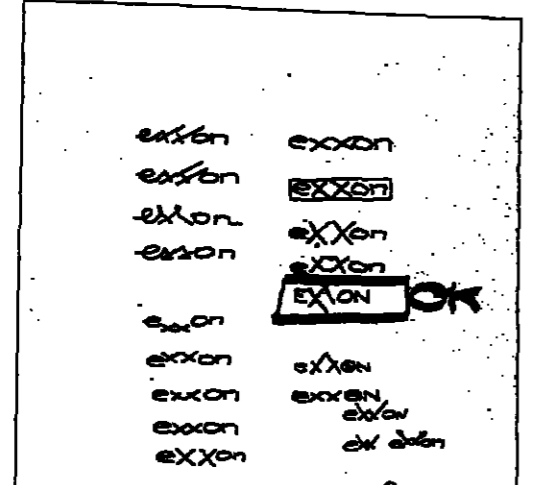
Technology Research

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NOTEBOOK

The Loewy Look

Technology in the post-war era inevitably carries the stamp of Raymond Loewy, the late designer who changed the face of products from Coca-Cola dispensers and toasters to television sets and cars and set the pace for industrial design from the '30s onward.



Networking Fees

The Federal Communications Commission is proposing that companies offering online data-transmission services through local telephone loops in the United States — for example, CompuServe, The Source, Quantum-Link, Telenet and Tymnet — should pay a special "access fee" to hook up to the phone network.

Airless Spare

For a motorist with a flat tire, few experiences are as dismaying as the discovery of a deflated spare. Enter researchers at the Uniroyal Goodrich Tire Co. who are developing what they believe is a workable airless spare.



New Ventures

In venture capital circles, recent breakthroughs in the esoteric field of superconductivity are sparking visions of new riches.

At least one new company has already been formed. Tentatively named the American Superconducting Corp., it will use seed money provided by American Research and Development of Boston and Rothchild Ventures Inc. of New York, two leading venture capital firms.

They disclosed at a congressional hearing last week that they had developed a method to make the new superconductors out of metal, which would make them far easier to manufacture than the brittle, ceramic-based materials developed by other researchers.



Biomagnetic Technologies' neuromagnetometer uses superconducting materials.

Paris to Tokyo in three hours? More than fantasy, the hypersonic jet is approaching reality.

Visions of Soaring at Mach 5

By Axel Krause

PARIS — The year is 2015. About 150 passengers have just been escorted past advanced Airbus, Boeing and Concorde aircraft at Charles de Gaulle Airport.

Somehow apprehensively, they file into a gleaming, snout-nosed, delta-wing plane now ready for the three-hour flight to Tokyo.

Shortly after takeoff, riveted to their seats, passengers are told that the world's first hypersonic plane is cruising — actually orbiting — at an altitude of 18.5 miles (30 kilometers) at nearly seven times the speed of sound.

Such a scenario, once a matter of dreams and sketches, is approaching reality. In the United States, Britain, West Germany, France and the Soviet Union, teams of engineers are working in secrecy to develop technology for hypersonic passenger planes, including advanced engines, fuel, materials and communications.

Even at today's prices, the costs sound exorbitant. For example, airline analysts estimate a round-trip ticket would have to be set at a rate more than double the price of a seat on the Paris-New York Air France Concorde, currently 27,180 francs (\$4,510).

Development costs of a hypersonic plane would easily reach about \$20 billion, according to U.S. companies. But hints of answers are beginning to surface on this score as well.

Future trans-Atlantic cooperation was strongly endorsed by ministers from Britain, France, West Germany and Spain at the air show. The U.S. government has not yet taken a position on such cooperation.

"There is a market, limited perhaps, but it's there," commented Alan R. Hughes, a marketing vice president for British Aerospace. "Regardless how I fly to Sydney from New York or Washington today, the trip is 24 hours. If a hypersonic gets me there in two hours for an urgent business appointment, that would make sense, because time matters."

But so does technology — both civilian and military — which most industrial and government planners view as the immediate and most difficult hurdle when assessing its components. These include the following:

• Engines. Currently, the world's fastest aircraft, the Concorde, the West European Tornado fighter and Lockheed's Blackbird reconnaissance plane, cannot exceed Mach 3, or three times the speed of sound. Engine makers are pursuing solutions that would permit speeds of up to Mach 25. Most generally agree with the approach of General Electric of the United States, which would combine turbofan and so-called ramjet technology. GE is also working closely with France's

state-owned Snecma exploring other possibilities, such as combining the use of hybrid turbo-ramjets, ramjet-rockets and turbo-ramjet rockets.

Ramjet engines, which were first tested for the German Luftwaffe near the end of World War II, contain no moving parts and would be used once the aircraft attains Mach 3, based on the following principle: Air for oxidizing the fuel is continuously compressed by being rammed into the inlet by the high speed of the aircraft. High-bypass turbofan engines, resembling current models, would be used to generate power that did not conflict with noise and pollution requirements up to about Mach 2.

While cruising, a transition period would last up to Mach 3, according to scenarios of Aerospatiale and MBB. Then, the turbofans would be shut down, as the ramjets powered the plane to higher speeds, possibly with the help of rockets.

The West German Ministry of Research and Technology and the European Space Agency recently commissioned MBB to pursue propulsion technology based on the so-called Sanger project, a proposed two-stage aircraft. This was the work of a German designer, Eugen Sanger, who developed the idea for a rocket-propelled aerospace plane in the early 1940s. According to MBB, its version could carry about 250 passengers at speeds of about Mach 5 with a range of about 13,000 kilometers.

Meanwhile, British Aerospace has begun testing a model of an engine designed for its proposed Hotol spaceplane, a reusable shuttle transport that would attain speeds of up to Mach 5. First versions of the Hotol would be used as early as the late 1990s for space missions, but later, they might be developed for commercial re-entry heating and pressures, according to company sources at the air show.

Materials. To withstand the projected speeds and surface temperatures, expected to range between 80 degrees centigrade (176 degrees Fahrenheit) and 600 degrees centigrade (1,120 degrees Fahrenheit) initially, new metals and plastics will be needed.

But companies and government research agencies involved in developing materials have been extremely guarded in providing detailed information.

New forms of titanium, stainless steel, polymers and metals reinforced with ceramics, boron or carbon threads may also be incorporated in the new aircraft. Novel alloys and other ceramic materials are being studied for the engines, turbines and combustion chambers, where temperatures will easily reach 1,400 degrees centigrade (2,544 degrees Fahrenheit).

Communications. This is probably the most guarded area of technology being studied, and apparently, the least advanced. Most development work in this area has been done in the United States, primarily on the shuttle program. Britain and France are studying avionics technology in connection with their respective Hotol and Hermes shuttle projects.

Probably nowhere is the work on a hypersonic plane more advanced than in the United States. Known as the National Aerospace Plane and financed jointly by the National Aeronautics and Space Administration and the Defense Department, the plane's engines are already being developed by GE and Pratt & Whitney, with projected speeds of up to Mach 25. Boeing, General Dynamics, Lockheed, McDonnell Douglas and Rockwell have started airframe studies, and contracts for the first flight demonstration aircraft may be ready to sign at the next Paris air show in 1989.

AXEL KRAUSE is the economics correspondent of the International Herald Tribune.

Preparing For Mars

Continued from page 9

has done studies lasting three or four months. U.S. studies in the past have reflected the fact that shuttle flights are limited to seven to 10 days. But with the advent of the proposed space station, where crews will stay aloft longer, and also with increasing interest in manned planetary exploration, he said, "that approach is now changing" in favor of longer term studies similar to those of the Soviets.

The more costly alternative research method is, of course, to put people into space. Here, too, the Soviets have pioneered. Since 1961, they have progressed from two hours in space to an eight-month sojourn.

The two-man crew aboard the Soviet space station Mir is now in the midst of a 10-month tour of duty which is expected to become routine for Mir crews. Also, two cosmonauts are the only humans who have repeated long-duration flights: they made two such flights each and one, Yuri Romanenko, is now aboard Mir for a third.

"The organism 'remembers' weightlessness and during repeat missions adaptation proceeds less painfully," said Tamara Breus, of the Institute of Space Research of the Soviet Academy of Sciences in Moscow. Mr. Romanenko has reported having a much easier time adapting to weightlessness than his less experienced crewmate, she said.

The longest any American astronaut has spent in space is just under three months (84 days) on the last Skylab mission in 1973-1974. No women have flown for more than 10 days.

"The data the Soviets are accumulating is very, very valuable data. Nobody else is doing it," said Dr. Arnold E. Nicogossian, director of life sciences for NASA, in Washington.

There is a limited flow of information from the Soviet program. American researchers say, "We talk with them, scientist to scientist. We understand what problems they're studying. We get certain publications," said Dr. Nicogossian. "But to have a working relationship where you can comb through their data, ask the questions, it doesn't happen."

The purpose of the research is to develop countermeasures, such as diets, exercise, fluid-loading, gravity suits and the like, that make it possible for space flyers to stay healthy and keep functioning, both while they are in space and when they return to gravity.

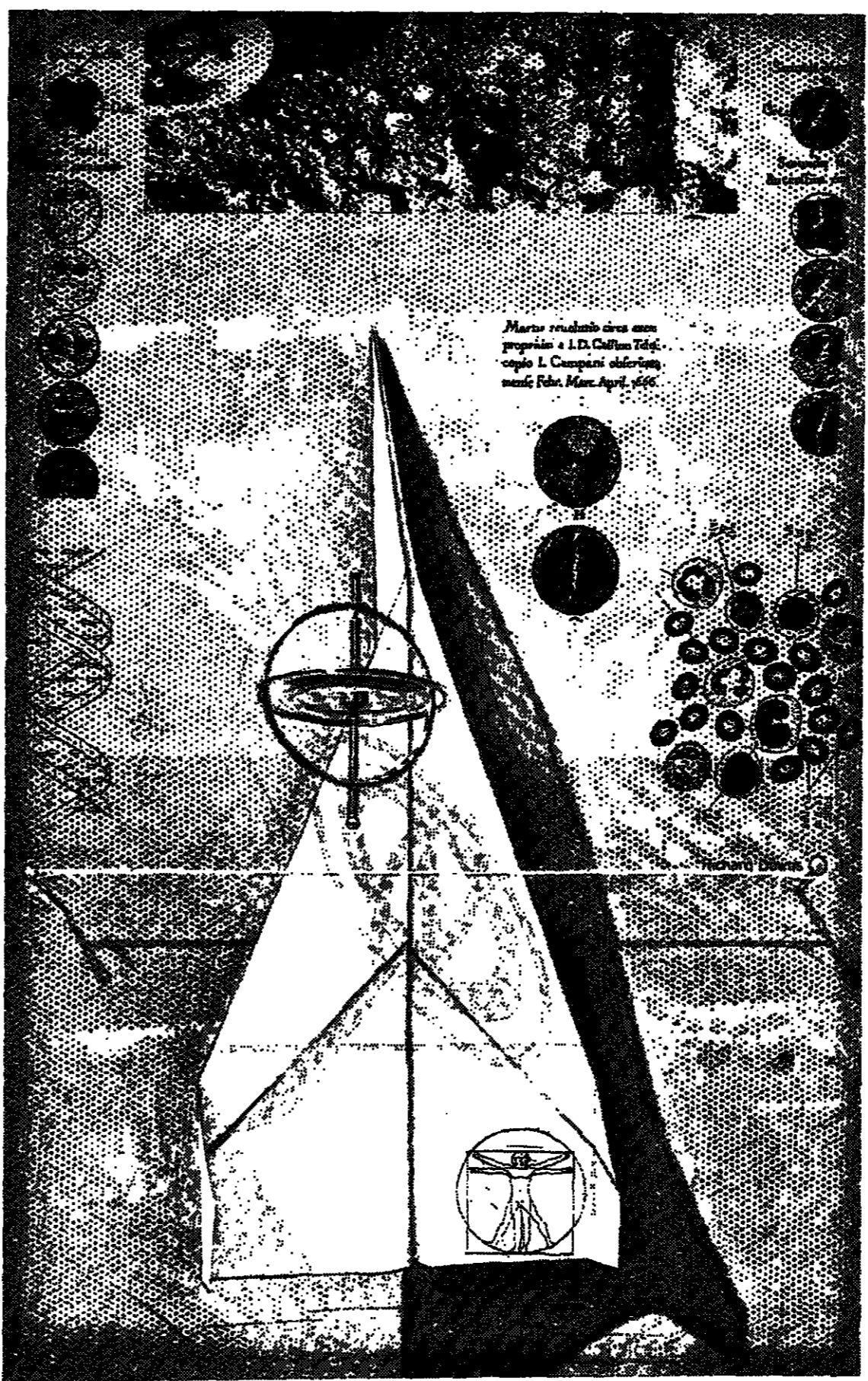
To counteract the muscle deterioration, for example, the Soviets require that their Mir cosmonauts exercise on a treadmill for at least two hours a day, an undertaking that reportedly generates a shroud of sweat.

"It's very uncomfortable" said John Charles, of Johnson Space Center's Space Biomedical Research Institute in Houston. The flyer has to harness himself to the machine to keep from floating off, he said, and the harness treats painful pressure points.

Skeptics within the research community maintain that cosmonauts comply with the exercise mandate "religiously" as long as they are within "camera range" of ground controllers, and then skip the rest, Mr. Charles said. "At least, so the story goes."

NASA, with its short-term manned flights, has no such requirements. Shuttle astronauts "usually exercise for about 10 minutes at a time, once or twice during a flight" to test muscles before landing, he said.

As for the loss of bone minerals, that presents a serious short-term problem in addition to its effects on bones themselves. "That calcium ends up in your blood and increases the potential for kidney stones, and this could happen



Mars resembles a red sun program by J.D. Collins. Top: copy L. Coopers electronic media Feb. Marc. April, 1987

Psychology Is Key on Long Flights

By Brigid Phillips

PARIS — To most mortals, the limits of space are as short as the imagination. To Patrick Baudry, a French astronaut, the concept of conquering space is as long as several millennia and defined only by the limits of the human mind.

Mr. Baudry speaks with the wisdom and enthusiasm of one of few humans to experience life in space. He has the objectivity of one who has worked with U.S. and Soviet space officials to expand the horizons of space.

For Mr. Baudry, the physical and technical obstacles associated with space travel are surmountable. Excellent physical condition is assumed. The astronaut learns the technicalities of how to conduct scientific experiments in space or the operations of the spacecraft by himself or with a scientist. But psychological constraints make for problems now and will only be multiplied for long manned space flights. Already, in both the Soviet and American programs, he said, training is a much lower priority for astronauts than mental preparation.

"The critical part comes when you start working together in the simulator," he said. In Moscow, that phase starts a year before liftoff. In the United States, the National Aeronautics and Space Administration requires three to six months in the simulator.

"You have to learn to know experiments or how to motivate others," Mr. Baudry continued. "Up there in that tiny area of the capsule, it is crucial to understand perfectly the personalities of the other team members."

When it comes to considering astronaut psychology, Mr. Baudry rated the Soviets far ahead. From 1980, he spent two years at the City of the Stars base near Moscow training for a June 1982 space flight, for which he eventually was named an alternate.

Each member of the team went through the same program of in-depth training that covered every task on board, from conducting experiments to operating the Soyuz-7 craft.

"I got training as a full-fledged member of the crew. Each crew member was interchangeable with the others. My training was extremely thorough and serious, and exactly the same as the Soviet cosmonauts got," Mr. Baudry said.

In 1985, he went through the equivalent American preparation and made a weeklong flight on the space shuttle Discovery, though there, he was treated as a lesser team member.

"Psychologically, it is more difficult in the American program," Mr. Baudry said. But he pointed out that NASA also has a much more rigorous and regular program of space flights. "The Americans have a real need for terribly tight organization that demands specialization. It is perfectly logical that they would categorize people. But that shouldn't be allowed to affect the psychology of the astronaut involved."

UNLIKE the Soviet program, U.S. space development is tied to commercial interests. "There is a pioneering spirit. The Americans know how to invest and how to take risks," he said. "The Soviets have little of that spirit of breaking away and battling for the lead."

But, Mr. Baudry found, the Soviets take a much more philosophical, visionary approach to space. "They have a view of their space program that is very long-term and consistent. The American program revolves around developments in the next few years with little of that futurist vision."

Mr. Baudry, 41, has put aside his career as a French Air Force test pilot. His "greatest letdown" was having to land on Earth after eight days in space aboard the Discovery, but he has no immediate plans for more space travel while he works on the development of Europe's space shuttle, Hermes. Yet his perspective, like that of the Soviets, is long-term.

"What will be achieved by 1989 does not interest me. Even 25 years is not as much as half a second in the scheme of things. What is important is to look across millennia," he said. "What will become of man on the planet Earth in the year 3000, 4000, 5000? Will this being that has created the power to destroy his planet have the wisdom to survive? And will we succeed in going beyond our solar system? These are the real questions of our adventure. My interest is in being a small part of the motor that drives the machine in the direction of a natural, logical and positive evolution."

KATHY SAWYER is the space writer for The Washington Post.

BRIGID PHILLIPS is a journalist based in Paris.

### Technology Developments

# Sale Furor Spotlights Submarines

By Malcolm W. Browne

**N**EW YORK — As the Soviet Union and the United States race to build the quietest submarines possible, the recent disclosure that a Japanese company sold robot propeller-manufacturing machinery to Moscow has underscored the growing importance of computer control to the weapons industry.

In a thermonuclear war, detection of the telltale noise produced by the propeller of a single lurking missile submarine could prevent the destruction of scores of cities. The sale by the Toshiba Machine Company to Moscow of computer-controlled machinery capable of making especially quiet propellers has, therefore, caused consternation among American military officials and has helped to sour Japanese-American relations.

Details of the technology required for making quiet submarine propellers are among the most highly classified of Defense Department secrets, and a Navy spokesman said Defense Department officials were barred from discussing the subject.

However, an enormous amount of information about screw propellers is in the public domain. In interviews, several marine propeller experts and former submarine officers discussed unclassified aspects of the quiet propeller problem on condition that their identities be withheld.

"It's a safe bet that the Russians have had a good grasp of the principles behind quiet propellers all along," a former commander of a ballistic-missile submarine said, "and they also probably had ways of getting the machinery they needed without help from Toshiba. Where they've lagged has been in the computer programming and software needed to drive these numerically controlled machines."

Most of the surface ships in the United States Navy are driven by complex, controllable-pitch propellers manufactured by the Bird-Johnson Co. using such equipment.

A numerically controlled milling machine is one in which a digital computer, programmed to direct a complex series of mechanical steps, sends numerical coordinates directing the machine's milling head along the paths it must take to remove the required amount of metal from the object it is shaping.

One of the main sources of submarine noise, experts say, is propeller cavitation. A spinning propeller blade cuts through water in much the way an airplane wing does through air. The front surface of the propeller blade, comparable to the upper surface of a wing, creates suction as it speeds through the water, and the suction pulls the propeller (and ship) forward. But above a certain speed, the blade moves too fast for the water touching its front face to catch up, and this creates a vacuum cavity, which may extend in a sheet along most of the blade's surface.

As the cavity sheet separates from the blade, it breaks up into microscopic bubbles that are ordinarily swept away with the flow of water. When the bubbles reach a distance from the blade, where the surrounding water pressure increases to its normal level, the bubbles abruptly collapse. Each collapse makes a small but sharp noise, and the collective effect of these cavitation collapses is a continuous roar audible to enemy sonar detectors.

The roar itself is not the only source of propeller noise. Each of the objects that stick out from a submarine's hull — the sail (superstructure), stabilizing fins, rudder and so forth — creates a turbulent wake distinct from the rest of the water streaming past the vessel. When a propeller blade cuts through one of these

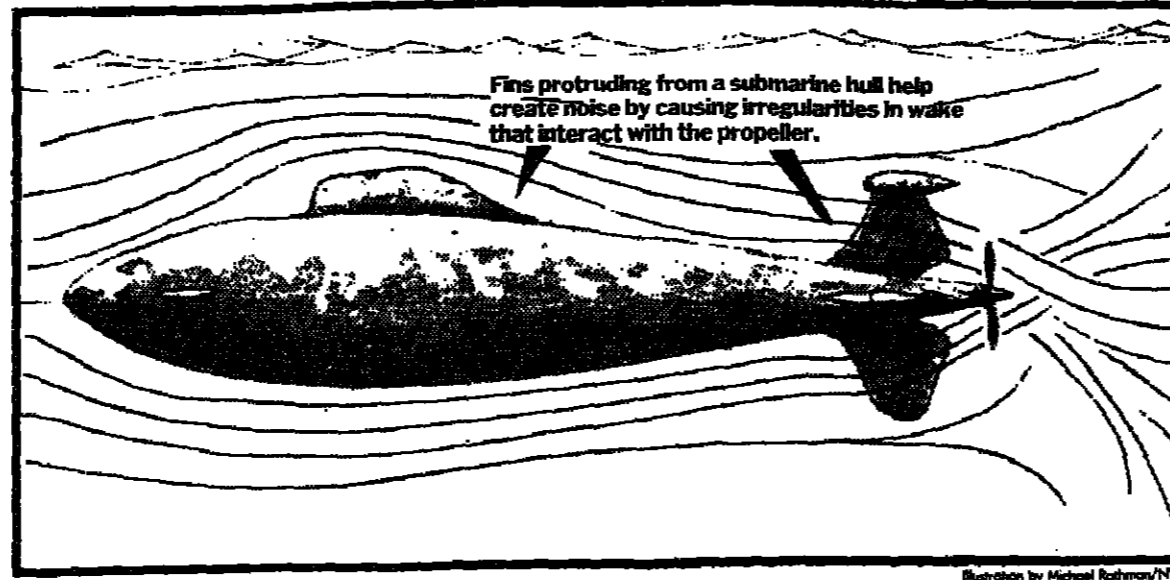


Illustration by Michael Rothman/NTT

turbulent discontinuities in the flow of water, a pulse of sound results: the principle is similar to a jet of air blown through the spinning holes of the disk in a siren. The more blades the propeller has and the faster it is spinning, the higher will be the pitch of the resulting noise.

All propellers cavitate above a maximum speed. Even below this speed, the blade tips, which are moving through water faster than blade roots, may cavitate. A submarine heeded across a wide stretch of ocean to its station ordinarily moves at high speed ("transit speed") until it nears its destination, and during this period its propeller cavitation is particularly noisy. Once on station, the submarine slows to a crawl ("patrol speed") to remain as quiet as possible. But even when a submarine is forced to travel comparatively rapidly, the captain tries to keep cavitation and other noises to a minimum.

"Obviously, the prudent submarine commander who must increase speed will take what steps he can to prevent cavitation noise," a former submarine officer said. "One way is to dive as deep as he can."

The onset of cavitation is determined partly by the pressure of water enveloping the spinning blade. The higher the pressure, the faster the blade can spin without tearing loose from the water in contact with it. Since water pressure increases rapidly with depth, a submarine can travel faster while remaining quiet if it dives deeply.

The design of the propeller also critically affects the spinning speed at which cavitation sets in. A large-diameter propeller that spins slowly is less prone to cavitation than a small one that spins rapidly, and modern submarine propellers are, therefore, relatively large; some Soviet propellers are so large their blades extend above the water when a submarine runs on the surface.

A nuclear submarine propeller, cast from bronze in one piece, generally has five or seven blades, and the number of blades affects its sound. The more blades that pass through a given wake discontinuity in a given time interval, the higher will be the pitch (frequency) of the sound. In general, high-frequency sound does not reach as far under water as does low-frequency sound, so a larger number of propeller blades may help defeat an enemy's acoustic detectors.

A particularly important factor in propeller noise is the shape of the leading edge of a propeller blade. In conventional propellers, the blades are more or less symmetrical, and the leading edge slams all at once into any wake discontinuity it encounters, creating a sharp pulse of sound. But in advanced military propellers, the leading edges of blades are swept back — skewed — in somewhat the way the wings of jet airplanes are swept. Skewed propeller blades slice across wake discontinuities at sharp angles, and the sound they make is therefore smoother and quieter.

Submarine propellers are also "raked," meaning that their blades are angled back from the shaft rather than perpendicular

to it. The blades are thus prevented from encountering some of the wake discontinuities that create sound.

Among the most important ways of increasing the speed at which a propeller may turn without producing cavitation noise is to eliminate irregularities in the smoothness of its curves, and it is for this that advanced robot milling machines like those made by Toshiba are particularly important, experts say. The slightest ridge, dimple or "pillow" on the face of a propeller blade, invisible to the naked eye, may be enough to trigger the separation of the blade surface from the water in which it is spinning and thereby start cavitation.

A bronze submarine propeller, perhaps measuring some 20 feet in diameter and weighing about 10 tons, is first cast from molten metal, cooled, and inspected for faults. It must then be machined to the exact dimensions specified by computer-assisted engineers who designed it. Finally, it must be perfectly balanced (by removing metal from one or more blades) and tested on a spinning shaft for vibration and other characteristics. These operations are so difficult and time-consuming that the cost of a propeller for a large, modern warship, industry officials say, is about \$1 million.

**P**ROPELLERS are traditionally finished by hand. Using template gauges to check their progress, workers grind metal away from each blade a little at a time until the appropriate template fits perfectly. Ten templates, fitted at equal intervals along the length of each blade, must all fit properly.

"But if you've ever worked in a machine shop, you can guess the effect of this," an engineer said. "A worker will grind down the blade at a template point to a perfect fit, but in the blade areas between templates he'll tend not to grind too hard, for fear of taking out too much metal. Invariably, this means too much metal is left between measurement points, with a certain amount of bulging or 'pillowing.' A propeller like that will pass all inspections, but it will cavitate at too low a speed."

Other experts said that in any case, Soviet submarines would have become quieter. Submarine noise comes from several sources besides propellers, one source being the vibration of gears, shafts, bearings, pumps and other machinery inside the ship's hull. This kind of noise is customarily reduced by mounting machinery on rubber blocks or otherwise isolating it from the hull. Builders also line hulls with foamed-plastic sound insulation.

"This Toshiba flap is just the latest," a former naval officer said, "but I suspect it's the understatement in our cat-and-mouse game."

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# Degradable Plastic Timed to Self-Destruct

By Thomas Netter

**G**ENEVA — Anyone who remembers seeing "The Graduate" may also remember laughing when the word "plastics" summed up a generation's aversion and contempt for the environment while in pursuit of "durable" security.

But these days, the durability of plastics is no longer a laughing matter. Mountains of synthesized polymer trash are growing. Plastic cups, bottles and picnic cutlery litter beaches and roadsides the world over, resisting degradation by water, rain, air or ultraviolet sunrays and micro-organisms. And burning is no solution: many plastics produce putrid, noxious gases when put to the flame.

Slowly, governments and the public are beginning to say, "enough."

This month, Florence banned the sale of plastic food bags and containers. Italy has decreed that all plastics used for non-durable goods must be made degradable by 1989. And as other areas of Europe, as well as the United States begin to react to the mounting scourge of indestructible plastic litter, the plastics manufacturing industry is stepping up its search for a solution.

"Until now, they usually wanted to stress how long plastics last," says Robert Fresh, an independent public relations consultant in Geneva who specializes in the chemical and plastics industries, "but that may be changing slowly."

Although photo- or bio-degradable plastics have been available for years, mass marketing has been slow and hampered by drawbacks. About 25 percent of the six-top plastic beer cans yokes now sold in the United States are photo-degradable, industry sources say. And each month, a Toronto firm called Ecoplastics, sells about 20 tons of a product called Ecolyte that breaks down in ultra-violet light so micro-organisms can do their work.

But many of these products have disadvantages. Ecolyte, for example, must be kept indoors to maintain shelf life, while other products such as Plaster developed by a company in Israel are unsuitable for food packages because additives used in manufacturing could spoil food. Companies in Britain and North America are producing degradable plastics that can be destroyed by bacteria or micro-organisms. But in many cases, cost is a negating factor.

One of the more promising developments is about to get full public display in Switzerland. A company formed in 1983, Belland AG, is to formally unveil its new degradable product next month.

Rolf Belland, the president and majority owner of Belland has invented a plastic product that can be dissolved when sprayed with water mixed with a chemical reagent tailored to specific applications and the uses expected from the material, according to Roman E. Kainz, vice president for corporate develop-

ment in the company's headquarters at Solothurn, Switzerland.

Mr. Kainz says the new product can be used for almost every plastic application — injection moulding, profiles, foam, liquid plastic or rigid plastic — "everything you can imagine in thermoplast applications can be made out of Belland plastic."

Mr. Kainz said in an interview that Belland can develop a polymer for an individual client's needs. The plastic is then manufactured, through a standard process that is licensed out, to manufacturers. Belland does not produce the product itself, Mr. Kainz said. The company has only 60 employees, two-thirds working at Belland's research and development facility in the tiny village of Biberist near Solothurn.

### Chemical agents can break down the material in seconds, hours, days or months.

The beauty of Belland plastic, Mr. Kainz says, is that it can be made stable against water, can have a long shelf life, or be used as agricultural film that is exposed to sun, light, water and micro-organisms.

"After the resistant period, you can define the time when it degrades," Mr. Kainz says. "And even this can be installed into the plastic, from seconds, to minutes, hours, days, or months."

The plastic can be programmed, either chemically by adding time reactive agents, or by producing it in such a way that exposure to water or a chemical agent, for example, would begin to break it down.

After the plastic is dissolved, it is broken down in an "environmentally safe" process of biological degradation. A one-year study indicates a 50-percent biological breakdown, and Belland assumes that within two years all residues will disappear. "What we know in using raw materials already tested is that there are no bad effects on the environment, humans, soils, or the air," Mr. Kainz says.

THOMAS NETTER is a journalist based in Geneva.

# W. Germans Test Digital System

### The underlying question: Will people really use the technology?

By Douglas Sutton

**H**ANOVER — The future of telecommunications in West Germany for the moment belongs to around 800 individuals in Mannheim and Stuttgart, in a pilot test that industry executives are confident is the start of a thorough reworking of the telecommunications landscape which will go far beyond West Germany's borders.

The testing, begun in January under the auspices of the West German Federal Post Office, covers two systems for the Integrates Services Digital Network, or ISDN, which combines the complex — multiple telecom services running simultaneously — with the simple: all via conventional telephone lines.

For the moment, two companies in particular are awaiting the Bundespost's extremely critical evaluation. They are Siemens with its Electronic Digital Switching System or EWSD used in Mannheim, and Standard Elektrik Lorenz (SEL), whose System-12 was put through its paces in Stuttgart.

But other West German firms, such as Telecommunications ANT, DeTeWe, and others, as well as foreign companies will be watching the Bundespost's appraisal. It is not just a question of the billions of dollars' worth of research and development costs already invested, but also on the line are the strategies that telecom firms have begun to draft for ISDN's future.

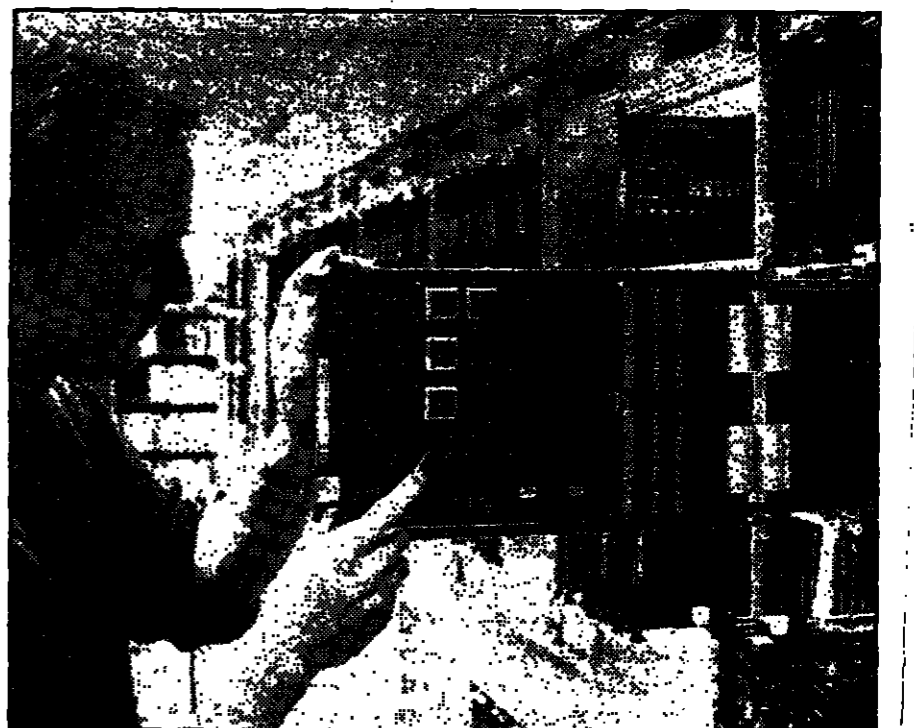
"The chief question in the pilot testing concerns is not just the technical side of ISDN. Everybody agrees digital communications is the technology of the future," said Rainer Mueller, a Siemens engineer and marketing manager. "What is also at stake is the question of user acceptance. Will the businessman and private household really use the multiple services offered under ISDN? This is, after all, the real test."

Industry officials agree that the question is one of educating the public, particularly the private household, who might not immediately know what to do with ISDN.

At the office equipment, communications and information technology fair CeBIT in Hanover last March, companies tried to educate potential customers on the uses of 144 kbit/s. This is the sum of two 64-kbit/s channels for the simultaneous transmissions of voice, text, data, and still images, combined with a third 16-kbit/s channel for coordinating and controlling these services.

In its display, Siemens linked a travel bureau, an architect's office, a bank and a private household, all variously equipped with telephone, telefax and telecopier equipment, computer terminals and normal TV sets. It showed them, hypothetically, going about daily business using the gadgetry simultaneously.

In the real-life testing in Mannheim and Stuttgart, the exacting standards of the Bundespost, meanwhile, were the most immediate hurdles. Mr. Mueller said that during the year-long period in which the Siemens and SEL systems were being tested, the post office had



A technician at Standard Elektrik Lorenz laboratories inspects a component of System 12, the digital switching hardware being tested in Stuttgart.

set a limit permitting only a couple of minutes of any kind of disruption in the ISDN services. West Germany is not alone, of course, in starting to test the ISDN waters. The list of countries launching or planning pilot projects in various forms of digital telecom technology in the near future includes Belgium, France, Ireland, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland, Britain, and the United States.

The West German project is the newest phase in the Bundespost's preparation to introduce glass fiber-based broadband transmission systems starting in the early 1990s.

Beyond that, the West Germans hope to prove that though the applications may be complex, ISDN-compatible systems, at least in terms of the 64-kbit/s channels, would be relatively easy to install as they replace the older analogue switching network.

Theodor Irmer, an engineer at the Geneva-based International Telegraph and Telephone Consultative Committee (CCITT), points out that, given the worldwide acceptance of clearly defined technical standards, ISDN networks could find widespread ready acceptance. "As paradoxical as it sounds, developing countries which are now just starting to develop their networks could have an extraordinary interest in digital technology," Mr. Irmer told the West German engineering association VDI publication Magazine.

He said that developing countries could sooner apply digital technology over a broader region than could the large industrial nations that were still operating analogue technology.

Siemens believes its EWSD system, which according to Mr. Mueller required about 2 billion Deutsche marks (\$1.1 billion) in research and development costs, has an advantage under the international standards for digital switching networks laid down by the CCITT.

Most recently Siemens concluded a sale of four EWSD units with a total of 43,000 con-

nections to Portugal. So far Siemens has sold its EWSD system to 52 telephone companies in 26 countries, for a total of 6.7 million telephone hookups.

In view of the tremendous up-front development costs companies need such sales to get their money back.

A Siemens executive estimated that the company needed a sales turnover of at least 10 billion Deutsche marks to recoup EWSD research and development costs. A board member, Hans Baur, said that Siemens needs a 15 percent share of the world market to preserve its ability to compete.

With such companies as AT&T, Northern Telecom, Japan's NEC, and Ericsson also developing and selling digital switching technology, many firms have begun to ponder whether they might have to join forces to survive. This was one of the chief topics discussed by industry executives at a world telecom symposium during the CeBIT exhibition.

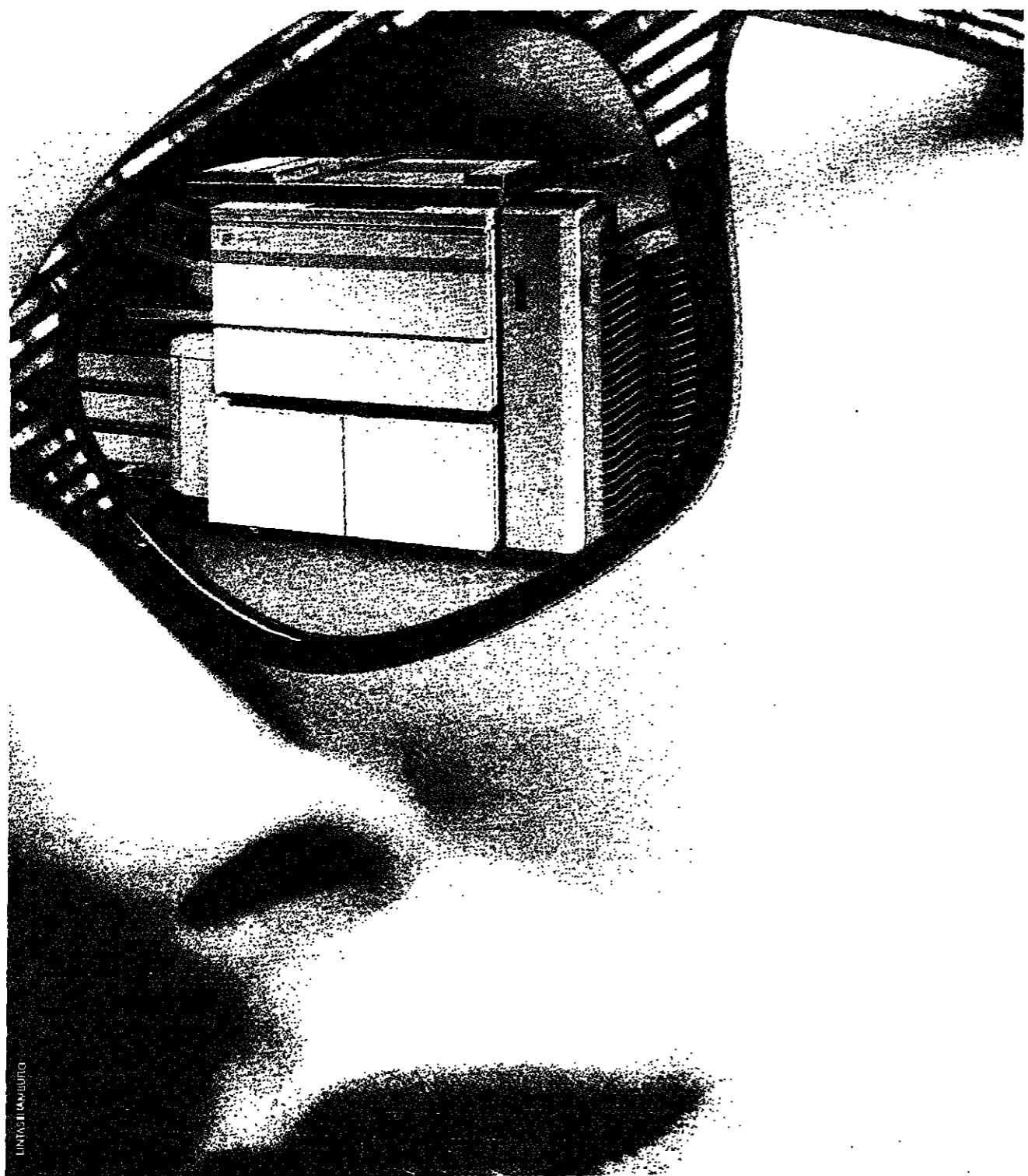
At that forum hosted by the weekly Wirtschaftswoche magazine, Mr. Baur said that there was a distortion of the market stemming from large mergers.

He also said that, while German cartel law restricted firms from gaining too much of a share of the domestic market — Siemens is under fire for its 45-percent share in West Germany — the competition was under no such restriction. He cited as one example Alcatel's 85 percent share of the French telecommunications market.

Sill, Mr. Baur was confident about the future prospects opened by the ISDN development. He said the Europeans were now in a position to gain territory worldwide in the telecommunications field, but warned that there would first have to be agreement on unified standards.

DOUGLAS SUTTON is an editor at the German Press Agency (DEA) in Hamburg.

Some people call it an eyecatcher...



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### Technology Workplace

## 'Networking' From Home

By Sherry Buchanan

**L**ONDON — Technology has freed us from having to work in an office. Yet, most of us still do. Most companies do not want to lose control over their staff or take the trouble to reorganize. And many business transactions require team work.

But experts agree that personal computers and computer links mean that more people in certain types of jobs will be able to work from home and will do so productively. Whether they will want to is another question. Not everybody is cut out to work in quasi-isolation, and people worry about the career implications of being home-bound: Out of sight, out of mind?

According to a survey of experts by the British Department of Trade and Industry, one quarter of the respondents said that by 1995, 10 percent to 15 percent of the British labor force would work from home and that 20 percent would work from home by 2010.

"Office Workstations in the Home" (National Academy Press, USA) looks at six case studies where staff worked from home and argues that there were 20 percent to 50 percent productivity gains.

Some companies such as Blue Cross-Blue Shield, British Telecom, ICL, the British computer group, Rank-Xerox, the European headquarters of the U.S. office equipment company, and F. International Ltd., the British software consultants, are readily encouraging some people to work from home and setting them up with the necessary computer links to communicate with each other and their boss. But, because of the perceived negative career implications, few men still take up the offer. Out of ICL's 280 off-site workers, 93 percent are women. Out of F. International's 1,000 home workers, 97 percent are women. Both companies started letting people work from home before the age of the personal computer to enable women to combine career and family.

ICL tries to recruit more men by offering good promotion possibilities. In ICL's book, being an off-site worker does not mean that you cannot become a manager if you want to. For example, Diana Hill, who started out as a programmer with ICL, now manages 170 off-site workers. Like them, she works from home and they have regular meetings at ICL offices.

Three years ago, Rank-Xerox decided to let a few of their staff members work from home. Senior management devised the project at a time when the company was trying to cut costs. By letting 54 people become "networkers," Rank-Xerox sought to retain people with certain skills but

managed to cut costs by offering them contracts that guaranteed them 100 days worth of work with the company. For the rest of the time, they were on their own.

Part of the Rank-Xerox deal was to lend networkers the computer equipment and software they needed for their specific job.

One networker, David Butler, who was a systems director with the company, started his own company, Artificial Intelligence Ltd., which now has an annual turnover of £2 million (\$3.26 million).

Another worker puts out the in-house magazine from home.

"I wanted to do my own thing: I had done my corporate bit," said Rosemary Vaux, who started working three and a half years ago from her spare bedroom in a cottage in Buckinghamshire. Her company, Ravenstone Public Relations, now handles other corporate accounts, and her husband, who worked as a television broadcasting engineer, has joined the company full time and looks after the production side.

"The technology is the crux: that is what makes it all happen," she said.

Some home-bound workers find it difficult to deal with isolation and loneliness. Others cannot separate home from work and find themselves doing house chores when they should be working. Managers recruiting people to work at home try to be selective.

"Not everybody can work at home, so we spend a lot of time on interviewing," said Diana Hill, general manager of CPS Professional Services, a division of ICL, which produces software packages. "We are looking for self-motivated individuals. We try to find in their background projects they have accomplished on their own."

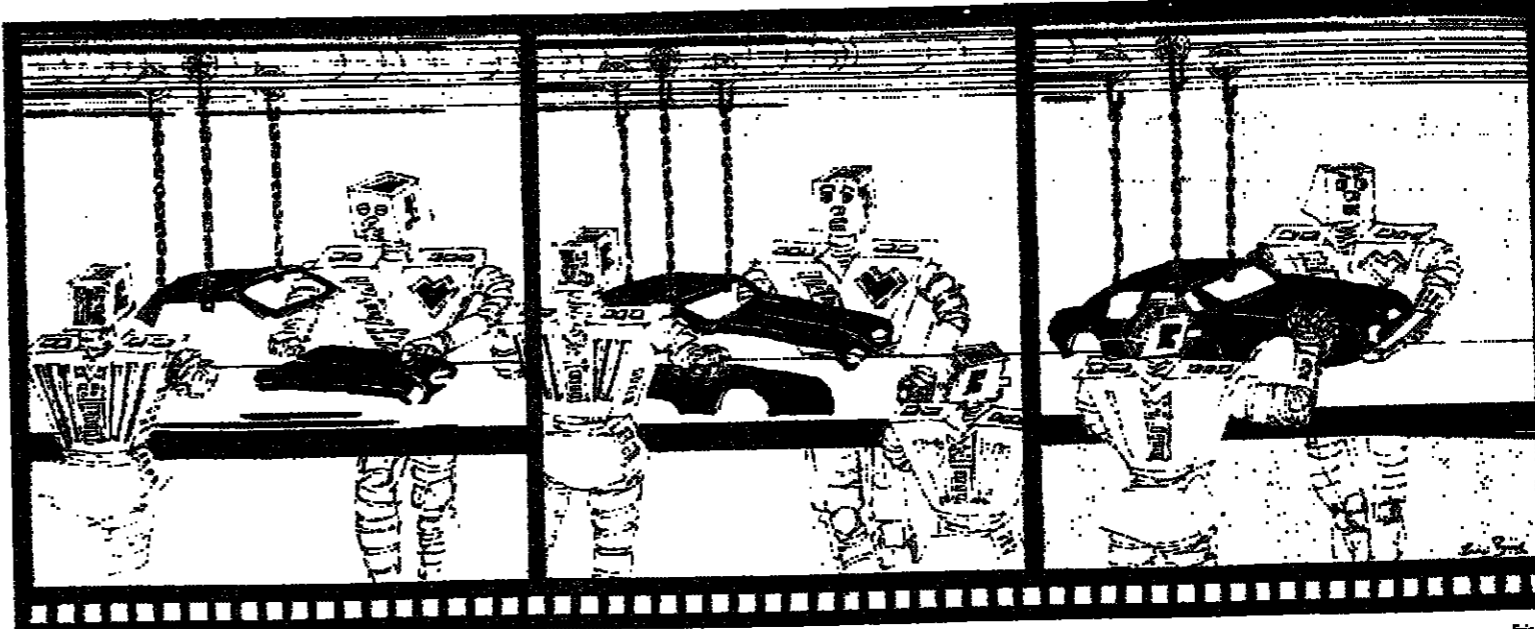
Some women quit because they could not cope with both children and job at home. One CPS bit of advice is to hire help for the children.

For the individualistically minded, working from home can help relations with the boss.

For the boss, on the other hand, it means devising more formal controls and maintaining constant communication.

"We have to get to know our staff very well," said Mrs. Hill. "Without being intrusive, we have to be aware of some of their personal circumstances because they are much more likely to be affected by them."

SHERRY BUCHANAN writes the International Manager column for the International Herald Tribune.



## Humanizing Factory of the Future

By Juris Kaza

**T**ROLLHATTAN, Sweden — For Sweden's highly innovative automobile industry, the manufacturing system of the future will be built on a lesson drawn from the past: The human factor is the key to performance.

Anders Svensson, a behavioral scientist working at Saab-Scania's main passenger car assembly plant, said that the most important element in auto production, whether highly automated or not, is a stable base of experienced and motivated employees.

When production technology begins to dehumanize or frighten people, it defeats its own purpose.

"You have a lot of high-tech car plants in the world that are not successful," he said. "In the next car plant generation, we will probably take a small step backwards in terms of technology."

Saab's facility at Trollhattan, near Sweden's west coast, is a giant complex producing over 60,000 Saabs a year, or nearly half the company's annual production. It boasts production equipment from Japan, France, West Germany and Sweden, including Asea robots that poke inside car bodies, spot-welding them in bursts of hissing sparks. The robots do work that was once done by human workers. Painting and body-part pressing is also almost wholly automated.

There is no single assembly line in Trollhattan but a series of "minilines" separated by buffer zones, where partly assembled vehicles wait to be passed from one work team to another.

"Carriers" bearing parts or whole subassemblies silently glide along passages between robot lines and work areas to computer-selected destinations. They stop smoothly when one of the soft bumpers detects a human standing in the way.

Trollhattan, and rival Volvo's plants at Kalmar and Torshanda, near Gothenburg, are the state of the art of Sweden's auto industry. But they will not be for long. Both companies are investing billions of kronor in a new generation of assembly plants at Uddevalla for Volvo and at Malmo, on the southern tip of Sweden, for

Saab. These plants are scheduled to be fully operational in the early 1990s.

Both facilities are to be built on the sites of abandoned shipyards, the mute remnants of Sweden's once-powerful shipbuilding industry.

Despite the extensive use of robotics, computer-assisted design and automated process control, the buzz words for future auto production methods in Sweden are "sociotechnology" and "job design," rather than the jargon of computer hardware and high technology.

"There is a widespread misunderstanding about the role of technology in our future factories," said Bert Jonsson, AB Volvo's vice president for human resources.

"There is a part of the manufacturing process that can be automated, such as the pressing of sheet steel, the making of motor blocks, transmissions, as well as painting and body welding. All these can be and all these are automated. But there is a part of production — the final assembly — which no one has automated and which won't be automated in the foreseeable future."

Volvo officials say that the future of the Swedish auto industry depends on innovations in the quality of work rather than the physical and technical processes involved, and their counterparts at Saab agree.

"The 'big bang' of high technology gives you a choice," said Mr. Svensson of Saab. "You can use your people just to load the automated machines, or you can use the operator's intelligence as far as possible. One way is to integrate the tasks around the direct assembly process, such as planning, materials handling and administration."

Saab has evolved an 8- to 10-member team system for its car assembly plants based on job rotation and considerable autonomy by each team in setting routines and objectives. Computerized process control has been decentralized, with each minilane controlled by its own computer, which one or several members of the respective production team are able to maintain and program.

Volvo's innovations in production are synonymous with the plant it opened in 1974 in Kalmar, on the east

coast of Sweden. Kalmar pioneered the use of teams and the breakdown of the assembly line into work areas, with cars moving along on carriers. Because it started its innovations all at once, Kalmar got more international publicity than the evolution of similar methods at Saab.

At their future plants, however, Saab and Volvo will be taking different paths in the development of work environments. Volvo's Uddevalla plant will actually consist of six workshops, each staffed by around 100 workers that will be responsible for the complete assembly of individual cars from start to finish.

**E**ACH shop will also be its own profit center, with workers' compensation packages including some form of incentive for improving productivity. Several teams may work side by side, but each will start with a "kit" of parts and finish its work by driving or rolling away a new car, according to Mr. Jonsson.

Exact plans for the working environment at Uddevalla are incomplete and are being developed by a small-scale experimental workshop near the future site that is training future employees.

Volvo officials say that the Rolls-Royce, widely considered as the world's finest car, is hand assembled, and the new facility at Uddevalla may try to create the atmosphere of a craftsmen's workshop while maintaining the speed and efficiency to produce up to 80,000 cars per year on two shifts.

At Saab, Mr. Svensson indicated that the new Malmo plant will probably run along the same lines — "a matrix of work teams" — as Trollhattan.

The main problem will be to arrange work so as to stimulate, challenge, educate and retain skilled workers, he said. A 10 percent or 12 percent turnover per year, with its loss of skills, can be just as damaging to Saab as a breakdown of a highly complex automated production line.

JURIS KAZA, a journalist based in Stockholm, contributes regularly to the International Herald Tribune.

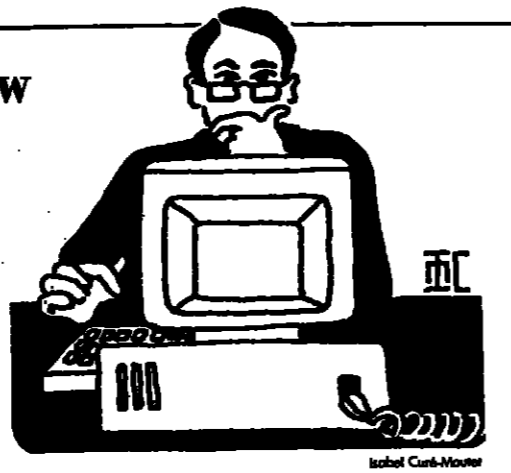
## PS-2 Gets Mixed Review

**NEW YORK (NYT)** — The executives responsible for buying and maintaining microcomputers for large corporations and government offices are giving the new IBM Personal System 2 computers a mixed review.

International Data Corp., a market research organization based in Framingham, Massachusetts, recently asked 200 management information systems heads to give their opinions of the PS-2 line of computers.

Only 1 percent expressed "unbridled enthusiasm," while 34 percent reported "moderate enthusiasm" and another 34 percent responded that it was "about what I expected."

But 27 percent asked, "Where's the beef?" And 4 percent expressed "dismay and/or outrage."



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One of the aims of agrochemical research is to achieve a good action using as little active ingredient as possible.

BASF research workers have succeeded in developing certain phytohormone herbicides which almost halve the amount needed for weed control without any loss in effectiveness.

The key to this success is provided by nature — by natural raw materials and the biotechnological processing of them.

Matze, potatoes and cereals yield glucose, which in turn is converted by lactic acid bacteria into lactic acid.

This is the building block for the specific manufacture of the biologically active component in certain phytohormone herbicides.

This biotechnological stage is followed by the manufacture of the end product by conventional chemical processes.

The active ingredients applied so far are compounds which consist of active and inactive components, or what scientists call dextrorotatory and levorotatory

molecules. Now for the first time biotechnology has made it possible to isolate and produce those molecules which are responsible for the herbicidal action.

The result: the amount of phytohormone herbicide applied to the field can be almost halved.

This advance means that the quantities stored and applied are smaller and that use can be made of naturally replenished raw materials.

This achievement is an example of how biotechnology dovetails with chemistry.

BASF is convinced this is where the future lies and is backing its conviction to the hilt.

To translate scientific knowledge to an industrial scale is one of the most challenging tasks of our times.

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**BASF**

Photomicrograph of lactic acid bacteria under polarized light.

### TechnologyAt Home

## Beyond Swatch, Swiss Innovating

By Thomas Netter

**G**ENEVA — Ever since the mass-produced, multicolored Swatch sparked a revival of the Swiss watchmaking industry, Swiss watchmakers have been producing more and more watches that have less and less to do with telling you the time.

Using the Swatch and its roaring success as a model and, perhaps, an inspiration, many watch manufacturers from Geneva to the Jura have gone beyond the original mass-produced, plastic-molded cases, rainbow colors, scented wristbands and multi-colored designer dials that mark the Swatch and Swatch-clones.

Some watches like Tissot's "Rock-watch" are just that, made of a piece of granite. Others, like "Le Clip," created by an entrepreneur named Michel Jordi last year, stick to the plastic and color formula and clip on just about anything.

"Fluk-Flak," created by Swatchmaker ETA of Biene comes in 10 "child pleasing colors" and a cardboard clock that helps children learn to tell time through the use of hands on the watch named Fluk and Flak.

Undaunted by Le Clip, Swatch has struck back with its "Swissbee," a watch on a large plastic paper-clip holder intended to be more chic than Le Clip's clothespin type design.

But all this is mostly in the realm of inexpensive fashion accessories. Nov-



Avalanche watch.

elities to be worn in different colors and different outfits, which is exactly what they are intended for — with the underlying tendency to be sold in greater and diverse styles and color like shoes or hats.

But technology has also gone beyond fashion.

Perhaps the most interesting and ambitious gadgets to emerge this year are the "Two-Timer" and "Pop-Recco." One saves time, and the other can help save lives.

Pop-Recco is designed to help locate people buried by avalanches. The joint effort of Swatch and a Swedish firm, RECCO A.B. of Stockholm, is basically a watch that clips into a small transmitter case worn on the wrist or on a strap around the arm.

Pop-Recco works with a receiver manufactured by RECCO that has been lent or leased to 17 ski resorts and rescue services in Switzerland, two in France, eight in Austria and two in Italy. If a person is buried in the snow, the Pop-Recco reflects the signal emitted by rescue helicopters searching the area.

The system saved at least one life last winter, according to Daniel Koch of ETA S.A. in Grenchen, where the Pop-Recco is made. The watch, in different, high-visibility colors, sells for 75 Swiss francs (about \$50). The Recco System, as the receiver is called, is not for sale, Mr. Koch says.

Tissot's "Two-Timer," the time-saver, is more mundane, but has nevertheless been hailed as revolutionary in its production method. The Two-Timer dispenses with a step in the production of the watches that involves separate manufacture of the plate and casing for the movement.

Aside from its nontraditional blending of an analogue dial face and digital time, date and day readout, the Two-Timer's most thought-provoking element is the insertion of the watch's moving parts into a stamped case. François Niklas of Tissot, a research and development specialist, said that this process cuts the number of parts used by 10 percent, and more importantly, saves from 30 percent to 35 percent of the manufacturing cost.

The Two-Timer is made by the Tissot brand of the SMH group, or Swiss Society for Microelectronics and

Watchmaking Industries. Ltd. SMH is the hybrid of the 1983 merger of the giant ASUAG and SSIH groups under a rescue package arranged by Swiss banks amid sale losses and price cutting by cheaper, non-Swiss rivals profiting from the electronic watch boom.

The Two-Timer, in nine varying "unisex" styles and colors costs 100 Swiss francs.

Innovation does not stop there. This month the "Wind-Watch," invented by Jean-Martin Rufer and manufactured by Guy Cattin of Breuleux, goes on sale for 100 Swiss francs, and will allow wind-surfers to gauge the wind speed on land or surfboard. Waterproof and in high-visibility colors, the watch is worn around the neck on a cord.

All these watches are in the low-price range and have resulted from a deep structural change in the Swiss watchmaking industry that saw employment plummet from 90,000 in the 1970s to 32,000 in 1985. Labor-intensive manufacture of movements has in many cases been replaced by machines and, according to the most recent survey published by the Union Bank of Switzerland, a majority of watchmakers regard their future earning power prospects as favorable to satisfactory.

With 10 percent of world market volume in non-centrally planned economies and 45 percent of the value, Switzerland remains the world's leading exporter.



Inspired by the moon landings, George Daniels, above, created the "Space Traveler's Watch" with old-fashioned technology, his hands. The \$330,000 watch, shown in Basel in April, displays solar and sidereal time, which is based on the rotation of Earth in relation to the stars.



## Toast of Tokyo: A Bread Machine

**F**OR those who have spent hours kneading dough, only to see it shrivel in the oven, Japanese companies are selling an automatic fresh bread machine. Pour water, dry yeast and flour into the top, switch it on and the machine mixes the dough, kneads it and bakes it. Up to four hours later, a fresh loaf appears.

The popularity of the machines, which sell for about 35,000 yen (\$240), has delighted the companies. Reuters reports from Tokyo, Matsushita Electric sold 150,000 of the small, square machines in the three months after it launched the product in March.

Matsushita plans to double its output of the bread machines to 100,000 sets a month. Funai Electric, an Osaka-based home appliance maker, has sold 36,000 sets since March. Toshiba, Hitachi and Sanyo two weeks ago announced plans to market similar machines.

Matsushita has no immediate export plans, but Funai plans to sell the machines in the United States and Europe by the end of the year.

## PC Price Watch

**P**ERSONAL-computer prices in the United States are heading down again. It happens every spring. But is it a good time to buy?

T.R. Reid and Michael Schrage, The Washington Post's computer watchers, are not so sure. They report that prices for IBM-PC and -XT and clones are falling fast. But they point out that the sharp drop — \$200 to \$500 for various models of MS-DOS machines — began right after IBM launched its new line. They note that the PS2 (or at least the Models 50, 60 and 80) has made MS-DOS computers obsolete.

A compromise: Some existing MS-DOS computers based on the 80286 microprocessor (IBM PC-AT or Kaypro 286) or the 80386 (Compaq Deskpro 386) will be able to use the new operating system and may run some of the software.

## The Latest in Entertainment: Compact Disc Goes Video

By Beth Karlin

**W**ASHINGTON — Just when you thought you had the very latest in audio-video equipment, you're hopelessly out of date. At least that's what consumer electronics companies want you to believe.

Hot on the heels of the enormous success of audio compact discs, manufacturers now are pushing compact disc video (CDV) as the latest must-have product.

The new CDVs are five-inch (12-centimeter) platters that combine short "video-clips" with music. Two types of players have been developed to handle the CDVs. One works only with the five-inch discs, while the other "combi-player" also handles two bigger discs that feature full-length movies and concerts.

BETH KARLIN, a journalist based in Washington, specializes in technology. CHRISTINE CHAPMAN is a journalist based in Tokyo.

CDV players exclusively for the five-inch format will start at about \$500, while the combi-players will cost more than \$800 in the United States. Both offer compact disc sound and high-quality video.

CDVs were introduced at the Consumer Electronics Show in Chicago in early June. Pioneer began shipping the first products in June, with a European launch planned for fall. Others, including Hitachi, Philips, Toshiba and Yamaha, plan to start selling their products later this year or early next year.

The five-inch version is best suited to MTV-style videos and, not surprisingly, is aimed at the youth market.

Combi-players, meanwhile, represent an attempt to revive an existing technology — laser discs — that never really got off the ground in the United States and Europe.

"It's old wine in a new bottle," said David Rosen, director of electronic entertainment for Link Resources, a market research firm. This format, popular in Japan, initially failed elsewhere in face of stiff competition from video cassette recorders (VCRs), which use

erasable tapes that can be recorded over and over, while laser disc players cannot record. Electronics companies are focusing on the more versatile combi-players. Pioneer, for example, has no immediate plans to introduce a dedicated five-inch player.

The marketing pitch is aimed at connoisseurs who want a complete home entertainment system, including both VCR for recording and combi-player for classics. "It's for the consumer looking for the best in sight and sound," said Michael Fidler, marketing vice president for Pioneer Electronics (U.S.A.) Inc.

John Messerschmitt, who spearheaded CDV development at North American Philips and is one of the leading proponents of laser disc technology, believes that as many as 700,000 players could be purchased next year. "The price will come down," he said. "And the units and discs will get better and better."

But some analysts wonder whether there is a large market for these products, particularly the five-inch model. "The audio portion of the video clips run four times longer than the video," one industry observer pointed out.

"It's hard to understand why anyone would pay \$500 to see just a short video clip."

And some consumer electronics companies still have reservations. Sony, for example, showed a prototype in Chicago, but reportedly is still not firmly committed to CDVs.

"The key will be in the availability of discs," said Mr. Ehrlich of Video Review. "It's a software-driven market."

At present, there are about 2,000 titles available on 12-inch laser discs and a few hundred eight-inch laser discs featuring concerts and full-length movies.

Capitol, CBS, Polygram and Warner/Electra and other record producers say they are committed to the CDV concept. They plan to introduce more than 250 different five-inch discs between now and Christmas. The video clips will cost between \$6 and \$8 to start.

Record companies, meanwhile, are stepping up production of laser disc movies and concerts, especially classics. "Videos are becoming collectibles," Mr. Rosen said.

Movie companies also are excited about the resurrection of laser discs via combi-players.

Laser discs are much harder to pirate than VCRs.

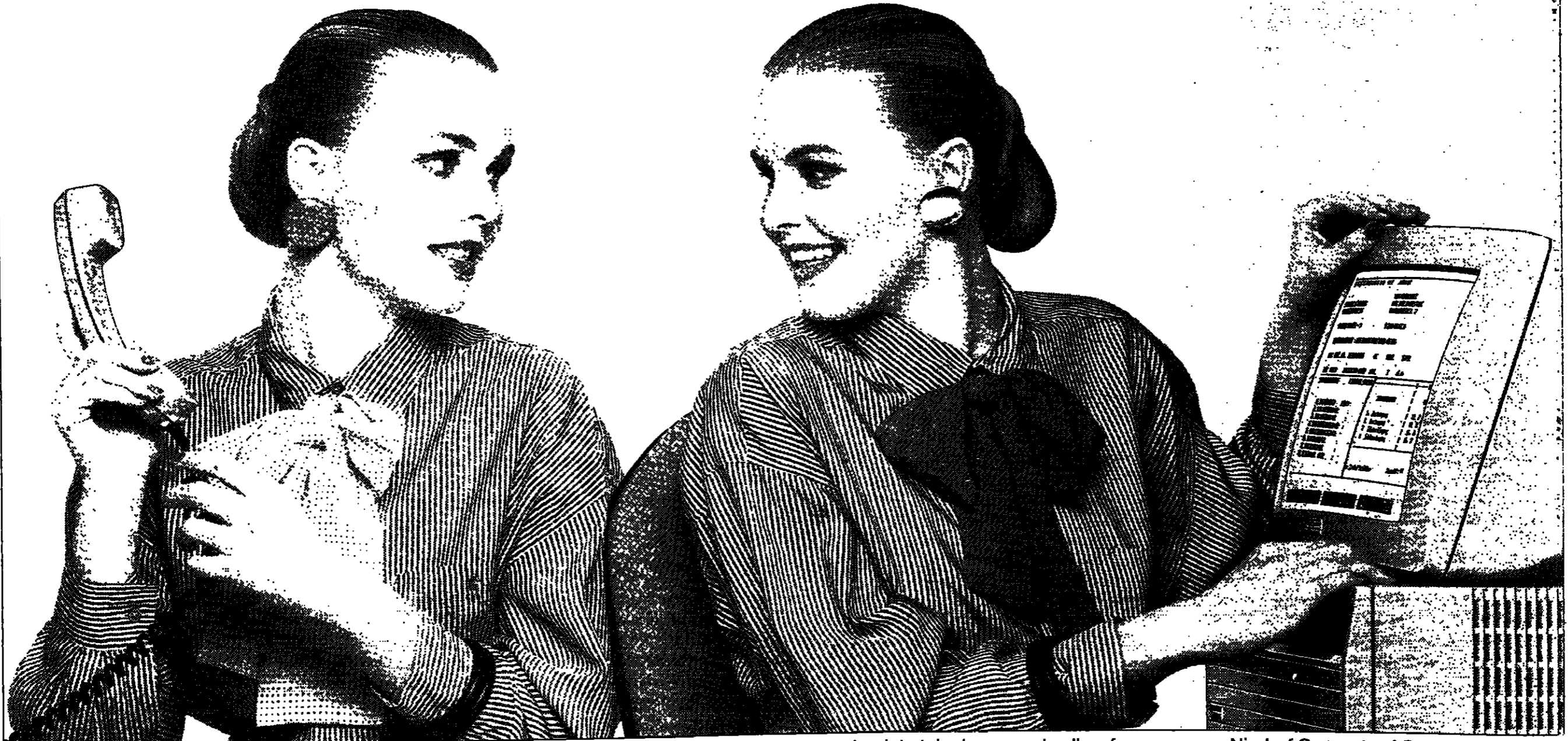
**T**OKYO — The CLD, or compact laser disc combination player, was introduced in Japan on June 1, priced at 148,000 yen (\$1,050) or about \$250 more than the cost in the United States, Christine Chapman reports.

A Pioneer spokesman said the differential reflects "strategic reasons" and a "different market situation."

Hajime Uchida, manager of the European section of Pioneer's international marketing division, said the European version will use a different color system than the U.S. and Japanese models. "We must make small changes in the system to fit their specifications," he said.

To achieve a finer, clear picture, more horizontal lines have been added. A super-refined digital recording is produced by doubling the filter capacity to achieve a higher frequency and less "jitter and noise," according to Pioneer, which credits its "sharp-eyed semiconductor laser."

## Nixdorf turns DP and telecommunications into twins



**U**ntil now, they were not even related. But through the medium of the Nixdorf Digital PABX System 8818, EDP and telecommunications become part of an integrated in-house information system which permits simultaneous transmission of speech, data, text, and graphics over a single telephone line.

The individual workstation can now be equipped with all of the information and communications components. The result is

up-to-the-minute information, greater flexibility, and increased productivity.

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now obsolete telephone, and call us for a PABX System 8818.

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**NIXDORF**  
**COMPUTER**

INTERNATIONAL STOCK MARKETS

Bangkok's Bubbly Market Seems Unlikely to Burst

By PATRICK L. SMITH International Herald Tribune

BANGKOK — There is a sense of déjà vu among local investors in Thailand these days. For many, the stock market's recent performance resembles nothing so much as a two-year boom in the late 1970s...

"The economy is on a very solid footing," a securities expert said. Among the world's small, newly popular markets, however, it is hard to match Bangkok's continuing attractiveness...

WEMAY BE LOOKING at a modest correction over the next few weeks, said Choedchit Sophonpanich, managing director of Bangkok First Investment & Trust Ltd.

As a consequence, popular blue chips such as Siam Cement, the Saha-Union textile group and Bangkok Bank are commended.

Saatchi To Merge Agencies

New York Firm Will Be Biggest

NEW YORK — Saatchi & Saatchi said Monday that it will merge its Dancer Fitzgerald Sample Inc. unit with Saatchi & Saatchi Compton Inc., creating the largest advertising agency in New York.

The merger will create a global operation that will be called Saatchi & Saatchi Advertising Worldwide, Stuart R. Upton of DFS said.

Saatchi & Saatchi, the British-based parent company, is the world's largest advertising agency holding company, followed by the Interpublic Group of Companies, Omnicom, and the JWT Group.

BBC Pays Libel Damages The British Broadcasting Corp. agreed Monday to pay an undisclosed sum in libel damages for reporting that Britain's Conservative Party dropped Saatchi & Saatchi as its advertising company...

American Slated as Jardine's Tai-Pan

Old-Line Hong Kong Trading Company Taps New Blood

By Nicholas D. Kristof New York Times Service

HONG KONG — It is not power so much as magic that swirls about the tai-pan, or "big boss," of the Jardine Matheson group — a legacy of opium and intrigue that goes with being the head of Asia's famous trading company.



Brian M. Powers had just 14 months' experience at Jardine when chosen to be its new managing director.

At least nine streets in Hong Kong are named for tai-pans at Jardine, a 155-year-old business that dealt in opium and silk in the last century and deals in everything from ice cream to investment banking today.

Brian M. Powers is 6 foot 2 inches (1 meter 84 centimeters), sandy-haired with a hint of gray, and looks a bit too affable to be tai-pan.

People in Hong Kong think they work very hard, Mr. Keswick said in his office 45 floors above Hong Kong's bustling central district.

home, as well as the tai-pan's second residence at Shek O, along the water. He apparently will also assume a seat on the board of Hongkong & Shanghai Banking Corp.

"The business style is different. The Brits are much more civilized than Americans."

— Brian M. Powers

Mr. Powers will presumably inherit the Mount Kellett Road home, as well as the tai-pan's second residence at Shek O, along the water.

EC Broadens Dumping Duties To Cover Parts

Compiled by Our Staff From Dispatches

LUXEMBOURG — The European Community on Monday extended its anti-dumping duties on imports to cover parts assembled in the EC.

The community's 12 foreign ministers, meeting in Luxembourg, unanimously agreed to impose duties if the value of the imported parts of a product assembled in the EC exceeds 60 percent of the total value.

These so-called "screwdriver operations" have been severely criticized because they use virtually no European parts.

These nations had expressed fears that extending anti-dumping duties to EC-assembled components could cut investments.

Such transactions have traditionally been handled by investment bankers, who receive a commission. As the business boomed, with outstanding commercial paper rising from about \$15 billion in 1966 to about \$300 billion in 1986...

More business leaders fly ALG than any other custom air service in Europe. ALG logo and contact information.

Currency Rates

Table with columns for City, Currency, and Rate. Includes entries for Amsterdam, Frankfurt, London, etc.

Table with columns for Country, Currency, and Rate. Includes entries for Australia, Brazil, Canada, etc.

Interest Rates

Table with columns for Term, Rate, and Currency. Includes entries for Eurocurrency deposits.

Table with columns for Term, Rate, and Currency. Includes entries for Key Money Rates.

Table with columns for Term, Rate, and Currency. Includes entries for Asian Dollar Deposits.

Table with columns for Term, Rate, and Currency. Includes entries for U.S. Money Market Funds.

Table with columns for Term, Rate, and Currency. Includes entries for Gold prices.

N.Y. Group Has Interest In Harcourt

WASHINGTON — A group led by Mutual Shares Corp. is looking to buy an undisclosed sum in libel damages for reporting that Britain's Conservative Party dropped Saatchi & Saatchi as its advertising company...

Japan Backs 'Buffer' Currency Fund

By Carl Gewirtz International Herald Tribune

HAMBURG — Japan's vice minister of finance suggested Monday that the leading industrialized nations consider setting up an international buffer stock of currencies as an additional means of stabilizing exchange rates.

Such a fund would be employed in much the same way that buffer stocks are used by commodities producers to smooth out price swings.

Mr. Gyothen said, however, that such a fund would be effective, he added. But on that scale, intervention could "alter the money supply in respective economies and influence the price of their currencies," he said.

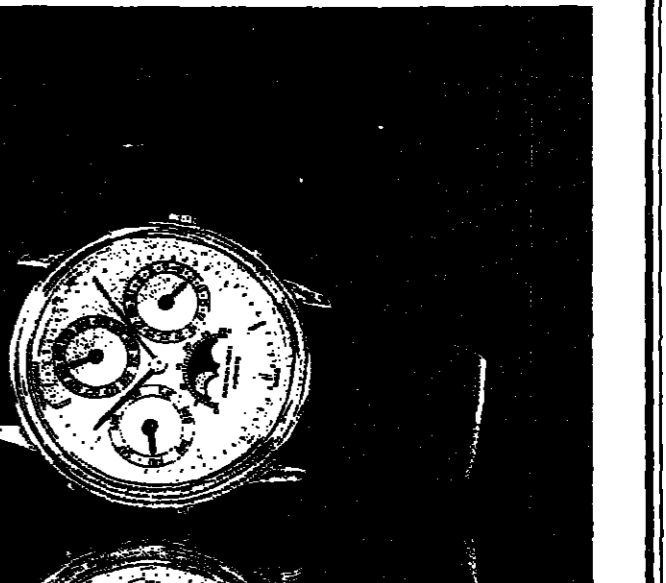
Mr. Gyothen emphasized, however, that no stabilization arrangements will be successful "unless the market is convinced that the existing disequilibria in the world major economies are now being reduced."

Among the day's speakers, there was unanimous agreement that currency instability resulted not from the floating-rate exchange system, however, but a mismatch of national economic policies.

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THE ORIGINAL. NOTHING CAN EQUAL THE ORIGINAL. Audemars Piguet La plus prestigieuse des signatures.





**BUSINESS ROUNDUP**

# Akzo NV Agrees to Buy Stauffer Unit From ICI

By Ronald van de Krol  
*Special to the Herald Tribune*  
ARNHEM, The Netherlands — Akzo NV, the Dutch chemical and man-made fibers group, said Monday that it had agreed to buy Stauffer Chemical Co.'s specialty chemicals business from Imperial Chemical Industries PLC of Britain for \$625 million.

The transaction, to be completed next month, marks the third time that all or part of U.S.-based Stauffer has changed hands since December.

Unilever, the British-Dutch food and consumer products group, acquired Stauffer as part of its \$3.1 billion takeover of Chesebrough-Pond's Inc., the U.S.-based pharmaceuticals group, in late 1986.

Earlier this month, Unilever recouped more than half of the Chesebrough-Pond price by selling Stauffer to ICI for \$1.69 billion.

ICI made clear that it was buying Stauffer for its herbicides and other agrochemicals, and would sell the specialty chemicals division.

Akzo said the acquisition would expand its presence on the U.S. market, add to its range of specialty chemicals worldwide and boost research activities.

Stauffer's specialty products include high-performance lubricants, flame retardants and catalysts.

An Akzo spokesman said Stauffer's specialty chemicals business had consolidated revenue of \$325 million in 1986, plus a 50 percent share in joint ventures with total revenue of \$1.25 billion.

The Stauffer division has a research center and six production plants in the United States, as well as activities in France, Japan, Argentina, West Germany, Belgium, Brazil, Australia and Canada.

Akzo's own chemical product division, which includes basic and specialty chemicals, accounted for about a quarter of last year's group revenue of 15.6 billion guilders (\$7.6 billion at current rates).

In March, Akzo's chairman, Aarnout Louw, said the company aimed to raise its level of U.S. investment to at least 20 percent of total assets.

The Akzo spokesman said the Stauffer takeover would raise U.S. assets to 19 percent.

# Daihatsu Motor Asks Official Aid In Polish Deal

*The Associated Press*  
TOKYO — Four Japanese companies, led by Daihatsu Motor Co., have asked the government to support a Polish auto manufacturing project that reportedly would cost 100 billion yen (\$704 million), the Ministry of International Trade and Industry said Monday.

MITI said it told the group that support would be difficult because creditor countries have not decided what to do about Poland's \$33.5 billion foreign debt. The group includes three trading firms, Mitsui & Co., C. Itoh & Co. and Sumitomo Corp.

The Nihon Keizai newspaper reported Sunday that under an agreement to be signed later this year, Poland's national automaker, FSO, is to assemble 3,000 of Daihatsu's compact cars a year beginning in 1988.

Later, the Japanese government would supply loans to build an integrated automobile plant capable of producing 120,000 cars a year beginning in 1992, Nihon Keizai said.

# Japan Airport Chief Rebukes Foreign Firms

*Reuters*  
OSAKA, Japan — The president of Kansai International Airport Co. berated foreign companies Monday for not trying hard enough to win contracts for the \$2 billion construction project, which is a source of friction between Japan and its trading partners.

"Whether Americans are putting enough effort into entering the Japanese market is 'doubtful,'" Yoshio Takeuchi said in an interview.

Several countries, led by the United States, have charged the government and the airport authority with shutting them out of the lucrative project near Osaka, which is to be completed in 1993.

But Mr. Takeuchi said it was up to foreign companies to adapt to Japanese markets. "They should not expect Japan to change to meet their demands," he said.

"The Japanese put forth a lot of effort in trying to export," he added. "They strive hard to overcome language, culture and other differences."

"But foreign companies did not seem to put as much effort into penetrating the Japanese market," he said. "Some even believed they could enter the local construction market without speaking Japanese."

Mr. Takeuchi last week rejected U.S. calls for changes in the design teams and bidding procedures for the project.

"Unlike American firms, we have a large number of in-house engineers," he told S. Bruce Smart Jr., the U.S. undersecretary for commerce, in a letter. "We therefore do not intend to include foreign or any other outside firms in our design teams."

In the interview, Mr. Takeuchi said that English or German speaking technicians could not succeed if they could not speak to Japanese construction workers.

"Some foreign people have splendid ideas, but with loop-holes," he added. "At present, I think the Japanese are comparatively skilled."

But Mr. Takeuchi said that foreign companies would be given a fair chance to win construction contracts for the airport.

"If the foreign companies are intelligent, offer good products at low prices, we will welcome them," he said. "It's silly to limit the work to Japanese firms."

Earlier this month, Kansai International awarded consultancy contracts to airport authorities from Britain, France, West Germany and the United States.

# HARCOURT: Potential Stake

(Continued from first finance page)  
ceeds Harcourt's available funds for dividends.

His suit also seeks to prevent Harcourt from issuing super voting preference stock to First Boston Securities Corp., and contests the June 8 conversion date for debentures as coercive and deceptive.

In a counterclaim filed Monday in New York, Harcourt alleged that British Printing failed to make disclosures required under federal securities laws.

Harcourt said that British Printing, Mr. Maxwell and the British company's majority shareholder, Bergamo Holdings Foundation, failed to file documents with the SEC on their stake in Harcourt.

The counterclaim noted that British Printing is arguing in the Florida state courts that it is entitled to convert its Harcourt debentures into more than nine million shares of Harcourt common stock.

Rumors that Harcourt was planning a takeover of Reed International PLC, the British paper and printing company.

Harcourt has refused to comment on the rumors. Traders in New York said they were skeptical of the report because it would be difficult for Harcourt to finance the takeover of another company if it carries out its recapitalization.

# BANGKOK: Boom Stirs Déjà Vu

(Continued from first finance page)  
ing substantial premiums to their listed prices in off-market trades among foreign buyers.

Similarly, the Bangkok Fund, which is listed in London, and the Thailand Fund, listed in New York, are both selling at 30 to 40 percent above net asset value, assuming that a seller can be found.

"If you're willing to be patient, you can still buy stock," said Marshall Anerback, director of G.T. Management (Asia) Ltd. "But it is a matter of moving slowly, accumulating a little bit at a time."

As in other small markets, foreign institutions are also branching out into second- and third-tier issues, in which supply is less of a

# U.K. Airport Authority Stock To Be Sold on a Tender Basis

*The Associated Press*  
LONDON — The government launched its privatization of Britain's state-owned airports on Monday with a novel twist of giving investors the opportunity to make individual tender offers for some of the stock.

The sale of BAA, formerly known as British Airports Authority, is expected to raise more than £1 billion, or about \$1.61 billion.

It is the latest in Prime Minister Margaret Thatcher's program to sell off billions of dollars worth of state-owned assets and to get more state into the hands of the private public. Most recently, the government sold Rolls-Royce, the aircraft engine maker, and British Airways.

In the latest sale, the government plans to offer a total of 500 million

# Marriott, Pritzkers Said to Pursue Allegis Buyout

By Sharon Warren Walsh  
*Washington Post Service*  
WASHINGTON — Marriott Corp. and Chicago's Pritzker family have been pursuing a joint buyout of Allegis Corp., the parent company of United Airlines, Hertz Corp. and the Westin and Hilton International hotel chains, according to sources close to the negotiations.

If they succeeded, the two interests would be likely to divide the Westin and Hilton International properties between them and sell off the airline and the car rental company, according to financial sources. Marriott is a hotels and foods group, and the Pritzkers own Hyatt Hotels Corp.

The cost of such a takeover has been estimated by analysts at about \$7 billion. By buying all of Allegis and selling off the non-hotel properties, Marriott and the Pritzkers would probably get the hotels for a better price than by bidding for the hotels separately, sources said.

The board of Allegis, which formerly was UAI Inc., said on June 10 that it planned to sell the company's rental car and hotel subsidiaries.

Terry Sowers, a spokesman for Marriott, said Monday: "We are currently having no discussions regarding Allegis."

But he said that, "under the proper circumstances," Marriott would be interested in acquiring the travel conglomerate's hotel businesses.

Mr. Sowers would not say whether Marriott had talked in the past with Pritzker representatives about Allegis.

However, industry sources asserted that Marriott and the Chicago-based Pritzkers had been involved in discussions for Allegis as recently as last week.

Allegis's shares closed Monday at \$90.375, up 12.5 cents, on the New York Stock Exchange. Marriott also closed higher, at \$42.875, up 12.5 cents.

Marriott, based in Bethesda, Maryland, reported sales of \$5.3 billion in 1986. Last year it bought rival Saga Corp. for about \$700 million and recently has been negotiating to buy Residence Inns and the Denny's Inc. restaurant chain.

Asked whether the Pritzkers were discussing a joint bid with Marriott, Darryl Hardy-Leonard, president of Hyatt Hotels Corp., said: "If that's true, I don't know it."

Representatives of Allegis could not be reached for comment.

The Pritzker family, which also owns Braniff Airlines, began to buy a stake in Allegis several months ago, at about the time United's pilots union put the company into play by proposing to buy United for \$4.5 billion.

Spokesmen for the union have said they will continue to try to buy United Airlines, and sources said Sunday that both Marriott and the Pritzkers would want to sell the airline.

Representatives of the pilots union could not be reached for comment Sunday.

A second group of Allegis employees has also drawn up a plan to acquire United Airlines as an alternative to the pilots' bid.

A large number of buyers, including Hilton

Hotels Corp., which is unrelated to Hilton International, and Japanese and British groups, are said to be interested in Allegis's hotel chains.

Analysts have estimated that the two chains, which have been consistently profitable, are currently worth about \$2 billion.

Both Hilton International and Westin are valuable for their real estate as well as for their hotels.

Donald Trump, a New York real estate developer who owns a small amount of Allegis stock, has reportedly said that New York's Westin Plaza alone would be worth \$750 million if it were turned into condominiums.

Marriott, which has 13 hotels outside the United States, has long been interested in expanding its international presence. Industry sources have said that the Westin hotels in Japan, Canada and Hawaii are of particular interest to Marriott.

Marriott currently owns more than 200 hotels and resorts, while Hyatt Hotels Corp. operates 80 hotels in the United States, Canada and the Caribbean. Hyatt International, a separate company, and its subsidiaries operate 41 hotels in 25 other countries.

Allegis Corp. became a diversified travel services company under Richard J. Ferris, who was forced to resign as chairman on June 9. The company's new chairman is Frank A. Olson, former chairman of Hertz Corp.

The Allegis board has said it hopes to sell off the parts of the company in a way that would maximize the company's value to shareholders. Mr. Ferris had opposed splitting up the conglomerate.

# Toshiba Corp.: 'We're Not Toshiba Machine'

*Reuters*  
TOKYO — Toshiba Corp. sought to distance itself Monday from a subsidiary accused of selling high technology secrets to the Soviet Union.

"We would like the U.S. government to understand that Toshiba and Toshiba Machine are different," a Toshiba spokesman said. "They may look the same from

the outside, and there is a stock-holding relationship, but the management is completely separate."

A U.S. deputy assistant defense secretary, Stephen D. Bryen, said last week that the Defense Department had stopped approving new military contracts with Toshiba Corp. because of Toshiba Machine Co.'s alleged transfer of advanced

submarine technology to the Soviet Union in 1983 and 1984.

The ban could cost the parent company hundreds of millions of dollars in electronics business with the Pentagon.

Toshiba Corp., which owns 50 percent of Toshiba Machine, has already forced Toshiba Machine's president and four other senior officials to resign.

# American Brands In \$600 Million Offer for ACCO

*Reuters*  
OLD GREENWICH, Connecticut — American Brands Inc. said Monday that it has agreed to acquire ACCO World Corp., a maker of office products, in a transaction valued at more than \$600 million.

Under the agreement, American Brands will soon begin a tender offer of \$29 for each ACCO share. The announcement pushed up ACCO shares by \$4.875 on the New York Stock Exchange, to \$28.375.

American Brands, a leading producer of cigarettes and liquor with its own office products subsidiary, said the tender offer is conditional upon selling the stapling product line of ACCO and two minor office product lines of American Brands.

# Benedetti, Gardini Boost Cooperation

*Reuters*  
MILAN — Raul Gardini, of the Ferruzzi and Montedison SPA groups, and Carlo De Benedetti, who runs the Olivetti SPA and Buitoni SPA groups, are planning to bolster a business alliance forged last year, informed sources said Monday.

The sources said Mr. Gardini would take about half of Mr. De Benedetti's 19 percent stake in a Milan investment bank, Euromobiliare SPA, and would acquire a minority interest in Mr. Benedetti's main industrial holding company, CIR.

The men, two of Italy's most powerful industrialists, would also form a jointly owned financial services company in which Euromobiliare would have a substantial role.

The sources estimated the cost of Mr. Gardini's Euromobiliare purchase at 18 billion lire (\$14 million).

Ferruzzi officials were not available for comment, but a spokesman said Mr. De Benedetti might make a statement on Tuesday when he addresses Olivetti shareholders.

The plan, if confirmed, would consolidate an alliance first struck last autumn that gave Mr. De Benedetti minority stakes in two major companies in the fast-expanding Ferruzzi agri-industrial group.

**ACCOR**  
A HOTEL, CATERING AND SERVICE COMPANY

**DISTRIBUTION OF FREE STOCK PURCHASE WARRANTS**

On June 22, 1987, the Board of Directors of Accor voted to distribute to Company shareholders one free subscription warrant for each share held. Ten warrants give right to subscription to one ACCOR share at the price of F.Fr. 625 before November 30, 1989 or F.Fr. 700 between December 1, 1989 and November 30, 1990. The warrants have received the visa (No. 87-218) of the French Stock Exchange Commission (Commission des Opérations de Bourse) and will be listed on the Paris Bourse.

Until November 30, 1990, new shareholders through exercise of 1985 C warrants held or through conversion of the French Francs 1983 convertible debentures or the U.S. dollar 1984 convertible debentures are eligible for the free warrant.

After November 30, 1990, the rates of conversion of debentures into shares will be adjusted.

This free issue is a consequence of the recent strengthening of Accor's shareholders' equity and should give both actual and potential shareholders a letter opportunity to participate in Accor's expansion, while providing additional funds to finance the company's growth.

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ACCOR, a world of new perspectives.

We are pleased to announce the election of

**EUGENE J. SULLIVAN**

as a member of our Boards of Directors

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Goldman Sachs International Corp.  
5 Old Bailey  
London EC4M 7AH.  
Tel: 01-489-2205.

**Wh**  
LEVERAGED CAPITAL HOLDINGS N.V.  
Curaçao, Netherlands Antilles

**Notice of Annual General Meeting of Shareholders**

Notice is hereby given that an Annual General Meeting of Shareholders of Leveraged Capital Holdings N.V. has been called by the Manager, Intimis Management Company N.V.

The Meeting will take place at the offices of the Company, John B. Gorsiraweg 6, Willemstad, Curaçao, Netherlands Antilles on 16th July, 1987 at 10.00 a.m.

The Agenda includes, inter alia, a proposal to amend the Articles of Incorporation of the Company.

The Agenda, the proposed amendments and the Annual Report for 1986 may be obtained from the offices of the Company or from the Paying Agent mentioned hereunder.

Shareholders will be admitted to the meeting on presentation of their certificates or of vouchers, which may be obtained from the Paying Agent against delivery of certificates on or before 10th July, 1987.

Willemstad, 23rd June, 1987.

INTIMIS MANAGEMENT COMPANY N.V.  
Paying Agent:  
Pierson, Heldring & Pierson N.V.  
Herengracht 214  
Amsterdam

**Monday's AMEX Closing**  
 Tables include the nationwide prices up to the closing on Wall Street and do not reflect late trades elsewhere.  
*In The Associated Press*

17-Month High	Low	Stock	Chg.	Vol.	PE	Div. Yld.	Div. Pct.	Div. Amt.	Div. Date
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25

17-Month High	Low	Stock	Chg.	Vol.	PE	Div. Yld.	Div. Pct.	Div. Amt.	Div. Date
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25

17-Month High	Low	Stock	Chg.	Vol.	PE	Div. Yld.	Div. Pct.	Div. Amt.	Div. Date
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25

17-Month High	Low	Stock	Chg.	Vol.	PE	Div. Yld.	Div. Pct.	Div. Amt.	Div. Date
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25
10	10	IBM	+	16	14	5.4	8.4	4.00	3/25

**INTERNATIONAL FUNDS** (Quotations Supplied by Funds Listed) 22nd June 1987

AL M&M MANAGEMENT	(w) Alameda Tech. Inv. Fund	(w) Alameda Tech. Inv. Fund	(w) Alameda Tech. Inv. Fund	(w) Alameda Tech. Inv. Fund
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AL M&M MANAGEMENT	(w) Alameda Tech. Inv. Fund	(w) Alameda Tech. Inv. Fund	(w) Alameda Tech. Inv. Fund	(w) Alameda Tech. Inv. Fund

**Floating-Rate Notes**

Issuer/Ref.	Denomination	Rate	Term	Issuer/Ref.	Denomination	Rate	Term
Alameda Tech. Inv. Fund	100,000	8.50%	90 days	Alameda Tech. Inv. Fund	100,000	8.50%	90 days
Alameda Tech. Inv. Fund	100,000	8.50%	90 days	Alameda Tech. Inv. Fund	100,000	8.50%	90 days
Alameda Tech. Inv. Fund	100,000	8.50%	90 days	Alameda Tech. Inv. Fund	100,000	8.50%	90 days
Alameda Tech. Inv. Fund	100,000	8.50%	90 days	Alameda Tech. Inv. Fund	100,000	8.50%	90 days

**FIRST AUSTRALIA PRIME INCOME INVESTMENT COMPANY LIMITED**  
 INTERNATIONAL DEPOSITORY RECEIPTS  
 Issued by  
**MORGAN GUARANTY TRUST COMPANY OF NEW YORK**

On June 5, 1987, the board of directors of First Australia Prime Income Investment Company Limited, a closed-end investment company listed on the Toronto stock exchange, announced the declaration of an interim dividend on the company's ordinary shares of US \$0.58 per share for the six month period ended May 31, 1987.

Payment of coupon No. 2 of the International Depository Receipts will be made in US Dollars on or after July 22, 1987, to the IDR Holders of record Company of New York.

— New York, 30, West Broadway.  
 — Brussels, 35, Avenue des Arts.  
 — London, 1, Angel Court.  
 — Frankfurt, 44-46, Mainzer Landstrasse.

The dividend is not subject to any Australian tax. The Belgian withholding tax will be applicable to IDR Holders presenting their coupons to the office of the depository without the appropriate Belgian non-resident certificate.

**MORGAN GUARANTY TRUST COMPANY OF NEW YORK**  
 Brussels office, as depository.

Be sure that your fund is listed in this space daily. Telex Matthew GREENE at 613595F for further information.

Source: Credit Suisse-First Bank Ltd, London

CURRENCY MARKETS

Dollar Rises Sharply in N.Y., Europe

NEW YORK — The dollar surged higher Monday, making dramatic advances against the mark and yen as weakness in the British pound spilled into most major currencies. Gold and silver fell sharply. Dealers said that the dollar's resilience of recent days reinforced speculation that it has found a near-term bottom. But they attributed the rise Monday largely to technical factors, including pre-programmed buying.

Table with columns: Currencies, Amt., Pct. Change. Includes Deutsche mark, Pound sterling, Japanese yen, Swiss franc, French franc.

seems to have happened in one day.

He said a rumor that Saudi Arabia was diversifying its portfolio by selling yen- and mark-denominated bonds and getting into dollars encouraged traders to buy dollars.

Another supportive factor, he said, is that dollar-linked commodity prices, especially oil, have been strong lately. Since customers purchase oil with U.S. dollars, rising oil prices signal stronger dollar demand.

Republic Bank in New York closed cash gold at \$437.50 an ounce, down \$7.50 from \$445.00 Friday. Silver plunged to \$6.73 an ounce from \$7.158 on the cash market.

In Europe, the dollar rose by more than 1 pfennig to its highest

value against the mark since March. In London, the dollar closed at 1.8407 DM, up from 1.8305 on Friday; at 145.85 yen, up from 145.05; and at 6.1325 French francs, up from 6.1025.

The dollar was also higher against the pound, which closed at \$1.5950, more than 2 cents down from \$1.6170 on Friday, and its lowest point since mid-March.

"It's getting more as though the market believes the dollar has bottomed out," said the top trader at one U.S. bank.

"The market is more fundamentally disposed toward the dollar as well as supported by technical considerations," he added.

The pound fell fast enough to prompt the Bank of England to step in and buy sterling in a bid to steady it, some dealers reported.

Yeutter Says Export Problem No Longer Dollar

WASHINGTON — The U.S. trade representative, Clayton K. Yeutter, said Monday that if exports do not increase now that the weak dollar has made American products cheaper, quality, service or marketing skills may be to blame.

Speaking at an American Stock Exchange conference, he said that "from a price standpoint, we are tremendously competitive in most things."

"So if our exports do not begin to accelerate," he said, "the exporters of this country must search their souls for other explanations because it's not price that will prevent those exports from moving up."

"It must then be quality or service or international marketing skills, he said, adding, "we must begin to focus on those elements of the export-import process," he said.

(Continued from first finance page) quitions in the United States and Britain, though he says this could be a single \$2 billion deal or a string of \$100 million purchases. Mr. Keswick says he would like a major U.S. presence, and he adds that Mr. Powers might want to return to the United States in five years or so and run the American wing of Jardine.

But familiarity with the U.S. market was not the reason for choosing Mr. Powers. Indeed, his nationality may even have worked against him a little, in the clubby world of British-run Hong Kong companies. His open style has ruffled some feathers here, he acknowledged.

And though Mr. Powers has joined the Jockey Club and he and his wife have entertained at their home on the Peak, their presence in Hong Kong's social circuit is subdued. "I like Hong Kong," he said, "but I work very long hours and I'm very committed to my job."

But if Mr. Powers has not always displayed enthusiasm for drinking and partying, his skill in law and finance. Those talents seem to have been key to his swift rise, after arriving at Jardine in April 1986 as "chief strategist."

The conglomerate was then in the process of slimming down — after some disastrous investments in real estate, shipping and oil.

Rivals for power within Jardine could not compete with a financial specialist at a time when the group was so absorbed by financial matters. Mr. Powers set to work planning a restructuring of Jardine's included spinning off subsidiaries and creating a web of corporations that own each other.

That allows investment strategies to be influenced by the positive fundamental factors, such as stable prices, low interest rates and good liquidity," he said.

Whether domestic demand can fully compensate for the decline in exports is questionable, however, economists said.

"People in Hong Kong think they work very hard. I think Brian has demonstrated that people in New York work even harder."

— Simon Keswick Managing director, Jardine Matheson



la. had a job that kept her in New York. Mr. Keswick arrived, and Mr. Powers finally perished in April of last year with a seat on the board and a mandate to direct financial strategy. Paula Powers, who was teaching at Columbia Law School, was willing to move to Hong Kong, and both parents thought it was the ideal time for their son, Jeremy, to live abroad. Mr. Powers has so far not studied Chinese.

As the new tai-pan, Mr. Powers will face a number of challenges. Despite diversification, a large share of the company's assets remain in Hong Kong. The property market and business climate here are volatile, even though Beijing has promised that it will allow Hong Kong to maintain its capitalist way of life for at least 50 years after 1997.

Then there is rising competition in Asia. Local entrepreneurs who in the last two decades have built their own conglomerates to challenge British interests. In Hong Kong, such Chinese entrepreneurs as Sir Y.K. Pao and Li Ka-shing have often outmaneuvered Jardine in the last decade.

These entrepreneurs are potential threats, for Jardine could become an acquisition target. One reason they have gained on British interests is that they know the market better — and that could be all the more true when Jardine is run by a man who is a newcomer to the region.

could help structure a deal. With characteristic bluntness, Mr. Powers asked the tai-pan: "This is a terrible question, but who are you?"

A relationship grew up between the two. Mr. Powers handled more and more Jardine business, including a complex sale of sugar interests in Hawaii that included a leveraged buyout with commercial and government financing. "That was an extraordinary piece of work," Mr. Wolfensohn recalled.

Indeed, it was one of the accomplishments that led Mr. Keswick at the end of 1985 to ask Mr. Powers if he would like to come to work for Jardine. Mr. Powers' initial response was that he was happy at Wolfensohn and that his wife, Paul

ments to correct what he described as an unequal playing field.

Some banks, he said, have total liberty in the positions they may take in the foreign exchange market. Others, such as most West European banks, are limited by banking supervisors in the size of the exposure they can undertake.

"The directives should be the same for all," he added, "we have seen overtrading, which must be avoided. Otherwise, we'll all get swamped with new restrictions. Either we all behave, or we are all losers," he said.

At the same time, he added, "we have seen overtrading, which must be avoided. Otherwise, we'll all get swamped with new restrictions. Either we all behave, or we are all losers," he said.

Koji Takahashi, senior managing director of the world's largest

BANKS: 'Buffer' Currency Fund

(Continued from first finance page)

commercial bank, Dai-ichi Kangyo Bank of Japan, called the suggestion a "workable idea."

For the past month, Japanese banks have been under orders to report their foreign exchange positions daily to the authorities.

However, Mr. Ghyoten said that "there was no intention to restrict activities in the market."

Rather, he said, excessive volatility in exchange rates drove the Japanese government to "ask" financial institutions to take the long-term implications of their actions into account.

Karl Otto Pohl, president of the West German central bank, or Bundesbank, also called Mr. Ekman's proposal "a good idea."

Bonn Economy Is Back in Growth Pattern, Bundesbank Says

By Ferdinand Protzman International Herald Tribune

FRANKFURT — After two quarters of negative or zero growth, West Germany's economy began expanding in the second quarter of 1987, and there are signs that growth is likely to continue, the Bundesbank said Monday.

In its monthly report for June, the central bank attributed the 0.5 percent decline in the nation's gross national product in the first quarter to unusually severe winter weather that nearly shut down the construction industry.

GNP measures the output of a nation's goods and services. Excluding the construction industry from calculations, GNP was up slightly in the first quarter from the previous three-month period, the Bundesbank said.

In the fourth quarter of 1986, however, GNP registered no growth from the previous quarter.

A drop in private consumption in the first quarter from the previous quarter also inhibited GNP growth. The central bank said that a glut of new-car purchases in the final quarter of 1986, triggered by a year-end expiration of tax breaks on autos with pollution-control equipment, distorted the statistics.

But the economy picked up in April, with a rebound in construction activity leading the way, the Bundesbank said. It said that investment in capital goods also was rising after stagnating in late 1986, and that exports had stabilized.

Exports had been declining as a result of the appreciation of the Deutsche mark against other major currencies.

While the report was cautiously positive about the prospects for continued economic growth after the slow start, many private economists are forecasting GNP growth of only 1 percent for all of 1987.

well below the government's prediction of just under 2 percent.

The government's forecast is based on a strong increase in domestic demand that would offset an expected decline in exports. The Bundesbank's currently expansive monetary policy is intended to help boost private consumption and thereby increase domestic demand.

The Bundesbank said the central bank money supply, its primary measure of monetary growth, grew at an annual rate of 7.9 percent in May, up from an annual rate of 7.8 percent in April. That pace is well above the Bundesbank's 1987 target range of 3 to 6 percent growth.

Some critics argue that the expansionary policy risks kindling inflation and may fail to spur domestic demand. Others say that excessive growth in the money supply would give a solid boost to the economy in 1987, but would result in recession by the end of 1988.

"The assumption of any GNP growth for the year is optimistic," said Gert Schmidt, an economist for Industriekreditbank AG in Düsseldorf. "It is also based on the dollar-mark exchange rate holding about where it is now, which in light of recent history seems very questionable."

But the dollar's relative stability since the Louvre currency accord reached in February by leading industrialized nations has triggered the mild rise in capital goods investment, said an economist for one of the largest West German commercial banks.

"That allows investment strategies to be influenced by the positive fundamental factors, such as stable prices, low interest rates and good liquidity," he said.

Whether domestic demand can fully compensate for the decline in exports is questionable, however, economists said.

For Brian Powers, the road to becoming tai-pan began in Massachusetts, New York. The second youngest of four children, he devoted most of his early years in high school to football. He even turned down Yale University initially to go to Holy Cross College because of its more rigorous approach to athlet-

ics. He transferred to Yale after two years.

An economics major, Mr. Powers graduated with average grades and then went to the University of Virginia Law School, where he excelled. He graduated near the top of his class and, after a year as a teaching fellow at Stanford Law School, he became an associate in the New York law firm of Debevoise & Plimpton. He is remembered there as a hard worker and a quick study who was fortunate to specialize in mergers and acquisitions just as the wave of mergers was beginning in the United States.

After two years there, Mr. Powers accepted a job as an attorney with the Ford Foundation. However, almost immediately he was put in charge of a large investment portfolio that included venture capital and real estate.

One of his first acts was to foreclose on two big real estate developments in the belief that that action could run them better than the developers. Colleagues noticed that.

Mr. Powers was at the Ford Foundation when James D. Wolfensohn, an Australian-born financier, called him. Mr. Wolfensohn was planning to set up a New York investment bank, and had heard about Mr. Powers from a Debevoise & Plimpton partner. So after four years at the foundation, Mr. Powers joined Mr. Wolfensohn, becoming his chief assistant at James D. Wolfensohn Inc.

Soon after the firm opened, a man named Simoa Keswick called. He was in the New York office of the Coudert Brothers law firm, and wanted to know if Mr. Powers

Monday's OTC Prices NASDAQ prices as of 4 p.m. New York time. Via The Associated Press

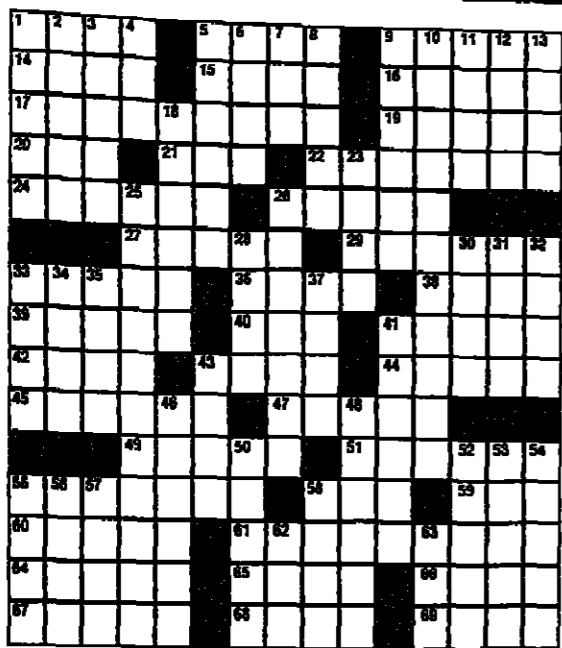
Large table of OTC stock prices with columns for stock names, prices, and changes.

Table of stock prices with columns for stock names, prices, and changes.

Table of stock prices with columns for stock names, prices, and changes.

Table of stock prices with columns for stock names, prices, and changes.

Sales figures are unaudited. Yearly highs and lows reflect the previous 52 weeks plus the current week, but not the trading day. Where a split or stock dividend amounting to 25 percent or more has been paid, the year's high and low are adjusted and are shown for the new stock only. Unless otherwise noted, all figures are in U.S. dollars.



ACROSS
1 Solidify
3 Kind of box
9 Variegated chalcidovine
14 Biblical prophet
15 Dramatist from Kan.
16 Punctuation mark
17 Burgess beast
18 Stratus, e.g.
20 Killarney-to Blarney dir.
21 Verb ending
22 They got away 24 P.M. item for a
26 Singer Della
27 Void
29 Peddler
33 Was eminent
36 Whirling vapor
38 Author Vidal
40 — Baba
41 Heavy literature
42 Kind of door
43 Hadrian's 564
44 Place for a hen party
45 "Sorrow chang'd to
47 Spat seen on
48 Actor Lloyd

© New York Times, edited by Eugene Malachuk.

DENNIS THE MENACE



"MR. WILSON SAYS WE'RE ALL BORN EQUAL, BUT AFTER THAT WE'RE ON OUR OWN."

JUMBLE THAT SCRAMBLED WORD GAME

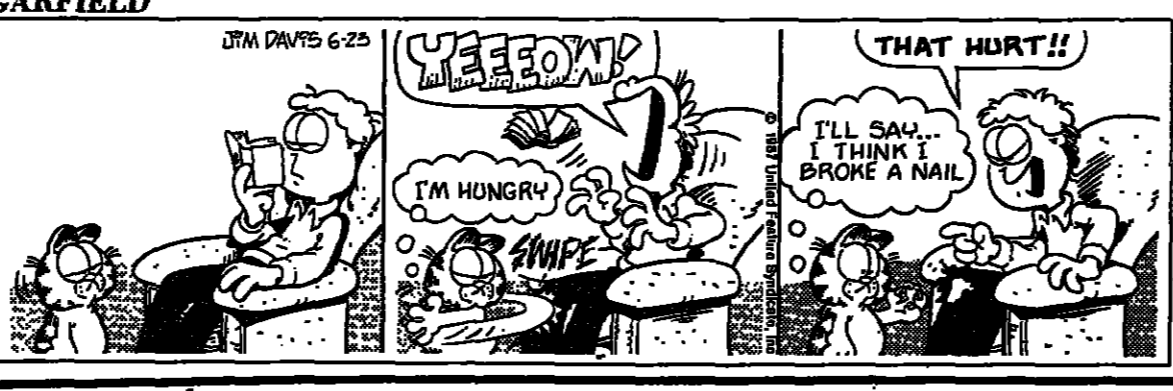
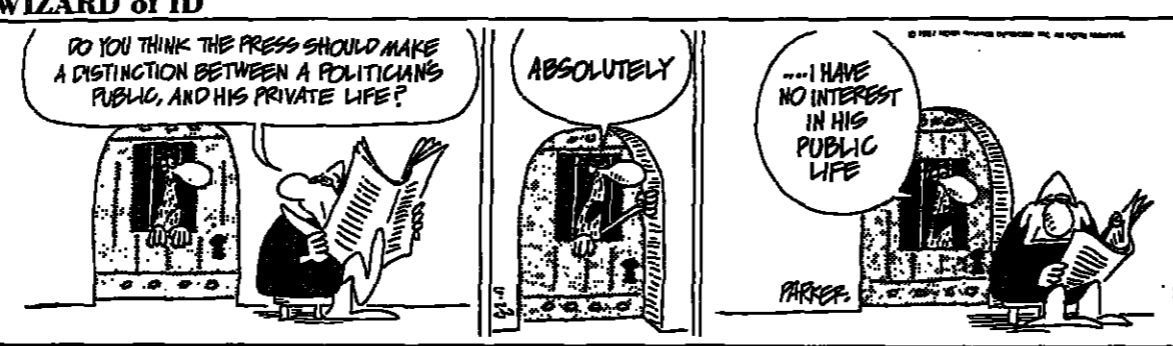
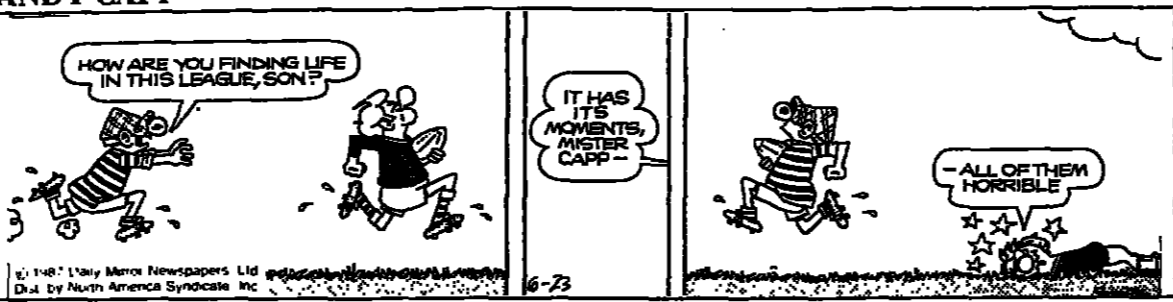
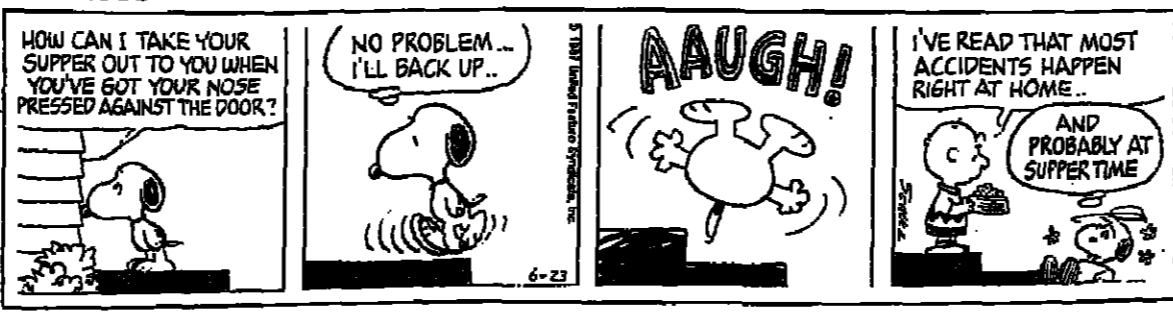
Jumble word game section with a grid of letters and instructions: 'Unscramble these four Jumbles, one letter to each square, to form four ordinary words.'

WEATHER

Weather forecast table with columns for Europe, Asia, North America, Middle East, Oceania, and Zurich. Includes high/low temperatures and weather conditions.

TUESDAY'S FORECAST: CHANNEL: Slightly cloudy, FRANKFURT: Partly cloudy, LONDON: Overcast, etc.

PEANUTS



World Stock Markets table showing closing prices in local currencies for various cities including Amsterdam, London, Frankfurt, Zurich, and Tokyo.

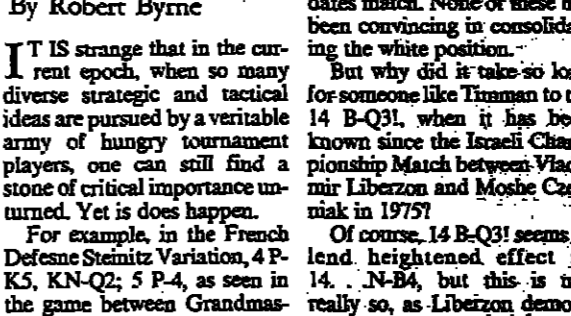
BOOKS

BEVERLY: An Autobiography
By Beverly Sills and Lawrence Linderman. 356 pages. \$19.95. Bantam Books Inc. 666 Fifth Avenue, New York, N.Y. 10103.
Reviewed by Florence King

"BEVERLY" is a sitcom full of belly laughs and Brooklynese wisecracks that has all the immediacy of a kaffeeklatsch confession. The funniest story concerns the time the 17-year-old Beverly Sills, née Belle Silverman of Brooklyn, went on a summer tour of the Midwest that found her in a village near Kearney, Nebraska...

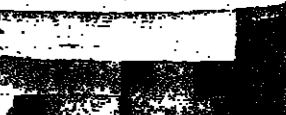
CHESS

By Robert Byrne
IT IS strange that in the current epoch, when so many diverse strategic and tactical ideas are pursued by a veritable army of hungry tournament players, one can still find a stone of critical importance unturned. Yet it does happen.



Of course, 14 R-Q3! seems to land the biggest effect. 14... N-B4, but this is not really so, as Liberson demonstrated. That game proceeded with 15 N-N3, P-N3; 16 O-O, R-K1; 17 N-N3, B-K2; 18 N-N3, B-K2; 19 N-N3, B-K2; 20 R-Q3, Q-R3; 21 Q-N3, P-B3; 22 Q-N3, P-B3; 23 Q-N3, P-B3; 24 Q-N3, P-B3; 25 Q-N3, P-B3; 26 Q-N3, P-B3.

Stock market index table for Zurich, showing various stock prices and indices.



SPORTS

Simpson Wins U.S. Open by One Stroke

By Thomas Boswell
Washington Post Staff Writer
SAN FRANCISCO — Scott Simpson found a place in history Sunday. The slim 31-year-old who, until Sunday afternoon had won just two events in nine years on the PGA tour, will join Jack Fleck, Andy North, Orville Moody and Sam Parks as an unexpected winner of the U.S. Open.

par and take the lead back alone. What had been a stampede just before the turn was a two-man race by the time Watson got to 14. Simpson, playing in the group in front of Watson, birdied from four feet at No. 14 to tie as Watson listened to the cheers from up ahead. By the time Watson reached the green, facing a downhill, 23-foot putt, Simpson had also knocked his ball to 20 feet at the 15th. As Watson lined up his putt, Simpson ran his home to take the lead.



Scott Simpson raises his arms in salute after the 18th hole.

Watson answered, tricking his birdie putt into the hole to regain a share of first. Now, it was match play, Simpson steaming hotly ahead, his concentration locked in place. As Watson watched from 100 yards behind him in the 16th fairway, Simpson ran a 12-foot birdie putt in the heart of the hole for what proved to be the winning shot.



Harry Carson, center, with Brian Sipe behind him are cheered by the French players.

200 registered teams, 146 of them in the senior, or adult, category. A crowd of 80,000 filled Wembley Stadium in London last August to watch the Chicago Bears beat the Dallas Cowboys in an NFL exhibition game. The Denver Broncos are scheduled to play the Los Angeles Rams in another preseason game at Wembley on Aug. 9 and most of the seats have already been sold.

With a bit of luck and publicity, the organizers of the 29-year French championship league hope for the same surge of interest to lift their sport out of the status of simply a curiosity. The French organizers had some publicity, as the U.S. Embassy in Paris and the National Football League Players Association combined to provide a week-long visit by Harry Carson, the New York Giants all-pro inside linebacker, and Brian Sipe, the former quarterback for the Cleveland Browns and New Jersey Generals.

Both men have been interviewed extensively by French magazines and television, which this year began showing NFL games in edited, week-of films. It also showed the Super Bowl live for the first time. Carson and Sipe have also attended news conferences, coaching clinics and autographing sessions and the Giants' linebacker even got to kick off a ceremonial ball for the Casque d'Or, or Golden Helmet, title game.

In Paris, Au-Dela Du Rugby

By Samuel Abt
International Herald Tribune
PARIS — The quarterback backpedaled, turned and tried to hand off the ball to an running back, but the cornerback was coming fast. "Attention au blitz," some spectators screamed, but it was too late and the quarterback was flat on the ground, sacre.

Reds and Braves Engage In a Little Baseball

Compiled by Our Staff From Dispatches
NEW YORK — The Cincinnati Reds and Atlanta Braves spent nearly as much time hitting each other as they did hitting home runs this weekend. "It was a fairly exciting series," Buddy Bell said Sunday after his 10th-inning home run gave the Reds a 6-5 victory.

Wimbledon Rained Out On First Day of Matches

WIMBLEDON, England — The opening day of the 101st Wimbledon tennis championships was wiped out by rain Monday, without a ball being struck on any of the 18 grass courts. After a gloomy, wet, overcast day at the All England Club, organizers announced late in the afternoon that there would be no play. It was only the fourth time in the history of the Grand Slam tournament that the whole of the first-day program has been rained out.

SCOREBOARD

Baseball

Table with columns for team names and scores. Includes entries for Detroit, Baltimore, Toronto, etc.

Basketball

Table with columns for team names and scores. Includes entries for Detroit, Baltimore, Toronto, etc.

NBA Draft Selections

Table listing NBA draft selections for the 1987 draft, including player names and team selections.

Robinson First Pick in NBA Draft

NEW YORK — The San Antonio Spurs, who sank to the bottom of the Midwest Division standings the past two seasons after years of having solid teams, took Navy's David Robinson with the first pick in the NBA draft Monday.

Seaver Retires From Baseball

NEW YORK — Tom Seaver, attempting a comeback with the New York Mets at the age of 42, retired from baseball Monday just 16 days after rejoining his old club. Seaver, a certain Hall of Famer who led the Mets to a World Series title in 1969, said he was unhappy with his progress after being sidelined for nine months.



Ayrton Senna waved the Brazilian flag after finishing first in the Detroit Grand Prix title Sunday, with a victory over competitor Nelson Piquet. Senna raced his Lotus Honda over the 2.5-mile course in 1 hour, 50 minutes, 16.4 seconds.

U.S. Open Golf

Table showing U.S. Open Golf scores for various players, including names like Tom Weir, Gene Sauers, and others.

Transition

Table listing basketball players and their transition from college to the NBA, including names like John Conley and others.

European Soccer

Table showing European Soccer league standings for various divisions, including Spanish First Division and Spanish Final League Standings.

Major League Standings

Table showing Major League Standings for various baseball leagues, including American League and National League.

INTERNATIONAL CLASSIFIED (Continued from Page 6) - A large advertisement section containing various classified listings for escorts, guides, and other services across multiple cities.

Pages 2 & 6 FOR MORE CLASSIFIEDS

ART BUCHWALD

No Credit for Adultery

WASHINGTON — "Washington School of Applied Ethics and Morality. Can we help you?" "My son is coming to Washington this summer and I would like to know if you are giving any courses in hypocrisy, betrayal and sleazebagism..."



Buchwald

"If your son is working in Washington this summer I would advise that he take a seminar in special prosecutors." "I didn't know you could take a whole seminar in them..."

Fragonard Sold For \$800,000

MONACO — A Fragonard landscape showing a watering place was sold to a Swiss buyer for 4,884,000 francs (about \$800,000) Saturday as part of a three-day sale of paintings, Italian drawings, furniture and china staged here by Sotheby's and the Monaco S&M firm.

"My son wants to know if you teach students how to shed incriminating documents." "Each student is required to own a paper shredder and burn bag. The burn bag can also be used to carry his lunch..."

James Dickey: Of Air, Flight and Stars

By Charles Truheart

Washington Post Service

COLUMBIA, South Carolina

—The belly of James Dickey swings gently to and fro, keeping time with his measured stride inside the black mesh fabric of his sleeveless shirt.

When Dickey comes to rest, he settles with a grateful sigh into the low-lying sofa in his suburban living room. He is 64 — "less than a year from official senility," he says, not entirely blithely.

Dickey has slowed down, and there's a reason. He was very close to death last year. "They drilled three holes in my head," he says, brain surgery for a subdural hematoma; he's fine now. He has also given up his legendary drinking. "I think too much of my body," he says.

In what might be called Dickey's second life, he's the husband of a 35-year-old former student, Deborah Dodson Dickey, called Debba, who is nearly as tall as he, and he is 6 feet 3. He married her in 1976, two months and two days after the death of his first wife. They have 6-year-old daughter.

Dickey's poems, mystical excursions into eros and the wilderness, won him the 1966 National Book Award (for "Buckdancer's Choice"). He served two terms as Consultant in Poetry to the Library of Congress.

Clear and wise and vigorous as his poetry was, Dickey was famous too for his own self. It may be said that he cultivated a personality — two-fisted, drawing, lusty, generous, steeped in whiskey — that came quite naturally.

His rollicking performances on the barnstorming circuit of poetry readings left deep and disarming impressions: of the possibilities of lyrical vernacular, of an almost dangerous backwoods energy wrestled into the fragile filaments of verse, all grace and power.

Dickey had two demanding careers, as a college teacher and then a composer of advertising jingles, before he turned to writing poetry full time at 38. But by 1970, he wrote the novel for which he is best remembered, "Deliverance," and its screenplay.

Poems noted especially for their reach have followed, and much else that accrues to versatile talent: criticism, children's books,

a teleplay of Jack London's "Call of the Wild," an autobiographical exercise called "Self-Interviews" and assorted decorative sentiments in books of pictures.

In January 1977 he delivered lines he had composed for the inauguration of his fellow Georgian, Jimmy Carter, one uplifter Jimbo's tribute to another.

But for a long time, in the back of Dickey's mind, has lurked something else, something bigger than a poem, bigger than a broad-brimmed hat. "Deliverance" it is "Altilium," a 682-page bruiser of a novel that Doubleday recently published.

"I waited 17 years after 'Deliverance,' because I wanted to do something different from that, to go out on another sort of edge, another sort of periphery, and to write a novel, if I could, that would have, maybe, philosophical implications, that would make 'Deliverance' in contrast look small and mean."

"Really the book is about the air," Dickey says. About the air, about flight, about the stars. Altilium is the center star in Orion's belt, a constellation described by one astronomy guide as "bathed in tenuous nebulosity."

"Altilium" is a tale told by a blind man, Frank Cahill. He has learned that his only son — whom he never knew — has died in a crash during a flight-training exercise; the time is World War II. Cahill, an impressive carpenter, makes a long bus journey with his German shepherd to an Army Air Corps base in North Carolina to find out what happened.

The facts of the accident are curious enough. By official accounts, Joel Cahill was the best pilot in his class, someone to whom flight was a sixth sense. Joel's plane went down — was sucked down, perhaps — in a brush fire he had plenty of reason to avoid.

A former pulled him from the burning wreckage, badly wounded but alive, and took him home. But in the ensuing confusion of the fire, when Joel was left alone, he managed to walk off. He is presumed dead.

The more Frank Cahill talks to his son's fellow trainees, the more he begins to understand that Joel



James Dickey: Between poetry and fiction.

was special, not of this earth, an oracle of sorts, a priest of flight. And the young man Joel does into his web have become his disciples: a secret society named Altilium, bound to execute the fallen martyr's will.

The book, in Dickey's words, is "a study of the sources of power, the nature of persuasion itself, the mysteriousness of causes." He asks: "Why would these boys follow this kid so blindly? Is it because he's a genius in an airplane?"

"He hasn't left them any program," he goes on. "He exists only in hints and parables and enigmas and aphorisms," he adds. "Rather like Jesus."

Not to put too fine a point on it, Joel Cahill has announced himself, and Dickey's intentions, with his initials, with the many tales

and versions of tales told of him in awe, with the puzzling circumstances of his "death" on the land of a farmer named Bledsoe.

"There are people who disappear and their bodies are never found, but people always claim to have seen them," Dickey says. "I wanted the hint placed, maybe not too strongly, that he's going to come back. He's going to be resurrected, or appear at some crucial time."

Who is Joel? "I think Joel is based partly on Charles Dickey says with surprisingly little hesitation. He is referring to his oldest son, Christopher Dickey, author and Cairo bureau chief of Newsweek. "Partly but not entirely, Chris is not that factual or that charismatic."

But Joel is also based partly on John Cornford, the young communist killed in the Spanish Civil

War. Dickey says. He leans forward and probes himself to his feet. "Enthusiastic, imaginative, rebellious, mysterious and enigmatic youth. — I wanted all of that," Dickey says.

Then he thinks of another way to put it. "He's the Rimbaud of the air," Dickey declares. "And I don't mean R-A-M-B-O. I mean R-I-M-B-A-U-D."

Dickey settled here 17 years ago to become writer-in-residence at the University of South Carolina. The inside of his conventional ranch house is manifestly the writer's domain: books stacked, spilling out, crammed; each unshelved wall a shrine of Dickeyana.

"There's never been any question at all in my mind that poetry is a superior art to fiction, but fiction has got one thing that art cannot do as effectively in poetry, and that is develop a narrative with people in it," he says. "Poetry is too highly concentrated, and too compact, to allow the relaxation and the leisure and the flow that the novel affords."

"Altilium" is uncommitted in the literal sense — no sections, no chapters — and punctuated by what some might call poetry, and some might not.

Pushing the envelope of the novelist's art, and conceivably the reader's ease, Dickey has tried something else in "Altilium": long passages printed side by side on a single page.

On the left, or "dark," side, in boldface type, are the perceptions of the blind narrator, how he imagines the people he meets, how his memories and dreams crowd his sightless vantage on the world. On the right, or "light," side, in lightface type, are what the others see.

"Did it bother you to read that?" he asks. "I think everybody has to work out his own method."

This is a big book, big in its audacity, big in its themes, big in the number of pages it has. James Dickey knows this.

"I told somebody, in the factious mood I must have been in, that I wanted to do for air what Melville did for water," he says.

"Now wouldn't that be something! It's a different element, and it's just as big. In fact," he says, "it's bigger!"

PEOPLE

Monaco Denies Reports Of Marriage for Rainier

Prince Rainier of Monaco, whose wife, Princess Grace, died after a car crash five years ago, plans to marry the German-born society figure Princess Iria von Furstenberg later this year, the British newspaper The Mail on Sunday said, quoting her son, Christoff Hohenzollern. No way, said a Monaco palace official Monday. Rainier, 64, would "absolutely not" wed the 47-year-old princess. "All these declarations come from the Furstenberg family. The Monaco family has said nothing," the spokeswoman said.

Manne Béjart, the choreographer and director of the Ballet of the 20th Century, says his decision to move his ballet company to Lausanne, Switzerland, from Brussels was motivated by a sense of adventure rather than by money. In a statement released by Lemanette officials, Béjart, 60, disclosed that he had been offered the same financial conditions to move to Paris as he had finally accepted in Lausanne, but added: "I am not a football star trying to jump up the bids between rival countries, but a lover and servant of dance." Swiss newspapers have reported that Lemanette officials offered Béjart an annual budget of 5.2 million Swiss francs (\$3.3 million) to bring his company there. The 65-member company, based Brussels for 27 years, will give its first performance in Lausanne on Dec. 18.

After wind and rain washed out Madonna's first scheduled concert in Tokyo, the rock star finally sang for 35,000 people in an outdoor performance Sunday. But 2,000 people who stood in line went away disappointed because the concert was sold out, organizers said. About 40,000 ticket-holders were turned away when the Saturday concert was canceled. In Milan, Frank Sinatra canceled a concert at the Campione Casino because "Singing in the Rain" cost him his voice, organizers said Monday. Sinatra lost his voice after performing in the rain Saturday at the Verona Arena. The singer, who is on a concert tour of Italy, refused to talk over with the orchestra under canvas tenting and instead broke into "Singing in the Rain." Sinatra expects to perform in Geneva Wednesday.

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